EDITORIAL

ILLEGAL MIGRATION AND HUMAN TRAFFICKING: ROUTES THAT TAKE ETHIOPIANS FROM FALSE PROMISES TO MISERY AND TRAGEDY

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Although migration is as old as time immemorial, human trafficking is the worst form of it that has shown a dramatic increment from time to time. The United Nations Trafficking Protocol (United Nations, 2000) defines the latter as:

> …the recruitment, transportation, transfer, harboring or receipt of persons, by means of threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability or of the giving or receiving of payments or benefits to achieve the consent of a person having control over another person, for the purpose of exploitation.

So far, a multitude of Ethiopians (women, men and children) have been trafficked to different parts of the world. According to a recent study by Meskerem Mulatu (Meskerem, 2011) the main destination of the migrants are the Gulf States through various routes such as Moyale, Bossasso, Afar, Djibouti, Metema and Bole International Airport. In another study by Khaled Ali Beydoun (2006), the influx of Ethiopian maids to the Gulf States through Bole, and the misery they endure is stated as follows:

> Almost daily a steady stream of young girls queue at the check in of Addis Ababa International Airport, destined for the Middle East. Smartly dressed, wearing makeup as they laugh and joke with each other, all long for a new life abroad with promises of high wages and a good job. Yet for most that dream becomes a nightmare as they are forced into prostitution or a slave-like existence as housemaids working 20 hours a day without pay.

A number of push and pull factors are said to be responsible for the prevalence of human trafficking. Economic and other oppressing conditions and lack of opportunities locally are reported to be the main push factors for human trafficking. In addition, high demand for cheap and unskilled labor force and availability of hard currency in destination countries are considered to be some of the pull factors.

The trafficking and the devastating degree of exploitation suffered by the trafficked Ethiopians appear to be a non-stop phenomenon. The *Ethiopian Reporter* on its September 29, 1999 release documented the ordeal of an Ethiopian migrant to Lebanon with the following terms:

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> As far as Ethiopian migrants are concerned Beirut is not really the dazzling capital of Lebanon; it is the city of untold misery and despair, of endless stories of ignominious horror and injustice. For your Ethiopian girls who end up there looking for a future, some future, Beirut is the Embassy of hell on earth (The Ethiopian Reporter, 1999).

What should be done to curb this problem? Raising awareness among the potential victims on the possibilities to work and live in their own country and about all the range of dangers out there on their way to the destination countries and afterwards? Making a cultural revolution, especially by instilling and cultivating a work culture in the minds of the younger generation? And what about the justice system to put the local and international smugglers and dealers who take the lion's share from the human trafficking business under trial? Besides, do we have a system that may enable us sustainably carry out all these goals? I leave the answer for interested researchers, policy makers and entrepreneurs to contemplate and bring in lasting solutions.

Journals like the Ethiopian Renaissance Journal of Social Sciences and the Humanities could bring out answers and similar questions and thereby create awareness among the people. We are proud to release the first issue of the second volume of ERJSSH. The current issue comes in a new B5 format with single columns. As it happened with the maiden issue published in 2014, it tackles different social problems from the country to which local and foreign academics provide an analytical perspective and also answers for the local populations and policy-makers. The Journal also inaugurates a section on book reviews, which should serve to discuss on the most recent publications having as a scope Ethiopia and beyond as well as to bring academics to focus on new scholarly titles from the growing editorial market of the country.

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ORIGINAL ARTICLE

A SURVEY OF ANYWAA (ANUAK) PROVERBS RELATED TO ANIMALS

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ABSTRACT

Ethiopia, a nation of more than eighty ethnic groups and a similar number of languages, some of them having no written form, has a great heritage of orature. Reflections on historical events and legends as well as expressions on religious, political, social and cultural life of the people dominate this vast treasure of oral literature. Though the Anywaa (Anuak) people, living in the Gambella Region of Ethiopia, are a small ethnic group in the country, their oral literature is very vast. Their social gatherings like 'Achonga' and 'Wimaach' are occasions for oral performance. Even their conversations are packed with proverbs related to occupations, like farming, hunting and fishing. This study concentrates on some of their proverbs related to animals. These proverbs represent the culture of the concerned society and, most importantly, they influence the day-to-day life of the people. Moreover, the samples of oral sayings selected for the study are typical as they serve the pedagogic, etiological, and entertainment functions of the genre.

Keywords: orature, oral literature, Anywaa, Anuak people, proverbs

INTRODUCTION

Oral literature or orature is the unwritten form of literature existing in the form of stories, poems, proverbs, riddles, and sayings. With its moralizing or didactic effect, it works as a corrective force among people. The pedagogic, etiological, and controlling functions of oral literature helps to unify the users. Over and above, it caters for the needs of moral up-lifting and protection of tradition among the members of the society. As Walter Ong says, "Oral cultures indeed produce powerful and beautiful verbal performances of high artistic and human worth, which are no longer even possible once writing has taken possession of the psyche" (Ong, 1982, p. 14). It is a matter of pride that oral literature continues to dominate the literature of Ethiopia, not because of the lack of writing or writers but because of the mesmerizing quality of its face to face performance.

The term oral literature refers to the verbal art of traditional cultures usually composed orally and transmitted from generation to generation. While Finnegan (1970) defines it as unwritten literature that depends on the performer who formulates it in words on a specific occasion, Dorson (1972, p. 661) defines it as oral composition imaginatively created or recreated by

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individual oral invention. Explaining its didactic function, Okpewho (1992, p. 112) opines that teaching ideals and conduct is a function of oral literature which helps society to justify its place in the universe. However, Barre Toelken (1996, p. 147) points out that oral literature gets its essence from the general context of its performance as it is continually renewed. He adds that the survival, continuity, and success of oral literature depends on how reasonably it satisfies intellectual interests as well as socio-political and economic needs of the society. As a utilitarian art, oral literature helps the society to maintain its history, culture, tradition, beliefs, and practices. The pedagogic, etiological, and controlling functions of oral literature serve as a unifying force. Though the subject matter in orature lacks reality, it continues to entertain masses. As Propp states, "The lack of correspondence with reality...offers special delight... Reality is intentionally turned out, and this is why people find them fascinating" (Propp, 1985, p. 19).

Generally, there are three levels of orality we find in African orature. The first is the level of ordinary communication with a purely denotative use of language, as in simple factual statements and commands; the second is the level of rhetorical uses of language, the use of proverbs and aphorisms which regularly channel communication in African cultures, and the third is the level of purely imaginative uses of language. The oral literature of Ethiopia can also be classified under these three levels of orality. As Abiola Irela says, "In reality these three levels exist along a continuum, for it is difficult to draw a sharp line between denotive and connotive use of language in oral communities" (2009, p. 9). As Hymens (1974, p. 32) states folklore study is the study of a communicative behavior with an aesthetic, expressive, and stylistic dimensions. Moreover, according to Ruth Finnegan (1992, p. 176) literary devices like metaphor, symbolism and allusive language have always attracted attention in the literary study of a style to which oral forms, especially proverbs, are no exception.

CONTEXT AND METHODOLOGY OF THE STUDY

Ethiopia, a nation of more than eighty ethnic groups and more or less a similar number of languages, has a great heritage of orature. Gambella in the south-west of Ethiopia and one among the nine regions of Ethiopia, is comparatively small but has many ethnic groups with varying cultures and languages. The major five languages of the region, Anywaa (Anuak), Nuer, Opwo, Majangir, and Komow are very rich in oral literature. Most of these peoples crossed the border of the Sudan in search of better pastoral life in the fertile banks of River Baro, which provided them with better living conditions. As Robert O. Collins suggests, the frontier line drawn by the Anglo-Ethiopian Treaty of May 15, 1902, has failed to bring peace in this area as "rivers do not automatically make good boundaries, and almost never do when the same people live on either bank" (1983, p. 366). Currently, the Anywaa, the Nuer, and the Majangir are established in three zones of Gambella.

Gambella is progressing rapidly. The modernization of Ethiopia has considerably affected its oral literature, and the orature of the Anywaa people

is no exception. Megbaru Esayias (2010, p. 14) suggests that "the rapid growth of globalization and technological innovation seem to be the reasons for low prevalence of oral literature". He emphatically points out, "Folk literature in Ethiopia seems overshadowed by western tradition in the name of globalization and modernization" (Ibid, p. 5). He fears that changes in life-style of the young generation, characterized by excessive movies and football games may be harmful to the survival of orature.

Some of the Anywaa informants who helped the researcher in collecting the proverbs also pointed out that the older generation could not transmit the oral literature to the younger generation, as it used to do in the past, because the youngsters have freed themselves from the direct grip of the community; most of them have gone to other parts of the country either for higher studies or for better jobs. In short, the younger generation has lost its enthusiasm for orature or has little or no time to formally inherit this legacy. Therefore, unless their orature is preserved for posterity through surveys like the present one, Ethiopia might lose a great legacy.

Though with the advent of writing, oral literature is losing ground, it continues to be produced as a natural outcome of inspired minds. Enlightened persons express their surprises and fears, protests and indignation, helplessness and victory, joys and griefs in such a way that their audience is delightfully entertained and morally edified by oral literature. While the modern progressive world is ignoring this great treasure of literature, it is encouraging that the people of Africa, especially of Ethiopia, still give great importance to their legacy.

This study is delimited to the orature of the Anywaa people, particularly to selected proverbs and sayings related to animals. The study aims at contributing to the understanding of the deep implications of such proverbs on the ways of life of the people.

The methodology used for the present paper is translation and interpretation without any deep theoretical underpinning. However, a self-reflective approach, which focuses on what the Anywaa orature tells about the concerned society and how 'writing' of oral data changes its performance, has been adopted.

The paper is the result of a few years of research on Anywaa. A preliminary discussion of the research was presented earlier in an article titled "The Anywaa {Anuak) Proverbs and Their Social Implications: A Thematic Study" (Raju, 2013). The research was conducted among Anywaa student community. The study focused particularly on proverbs because unlike other genres of oral literature, proverbs have little chance from time-to-time changes made in accordance with the whims and fancies of the performers. In other words, if a performer changes the structure of a particular proverb, it will lead to the creation of another proverb so that the number doubles.

The data for the present study was collected with the help of Anywaa students who were undergoing their undergraduate or postgraduate studies

at the University of Gondar. Due to time constraints, it was not possible to visit Gambella Region to collect the data directly or to interpret them with the help of the elders of the society. Instead, Anywaa students were, first, interviewed individually and, later, group meetings of selected interviewed-students were arranged in which the proverbs were discussed. The meanings of the selected ones (proverbs related to animals) were explained and interpreted, and the interpretations were unanimously approved.

In the paper, the proverb in its original Anywaa script is given first. There follows an orthographic transcription in English with a word-by-word meaning which should help those who are not able to read the Anywaa script. It must be noted that the Anywaa language today is written in the Latin script with various diacritics to capture the phonology of the language. Then, the English translation of each proverb is given followed by its explanation and interpretation. The proverbs are arranged in alphabetical order of the names of the animals related to them.

THE ANYWAA PEOPLE: THEIR HISTORY AND ORATURE

In the past there, was no border line between Sudan and Ethiopia and the people crossed and moved wherever they liked in search of water and other resources. According to tradition and legends, a tribe called Masango was the original inhabitant of the banks of the Rivers Baro and Gila. Then tribes like the Anywaa and the Nuer came from the present Sudan area and pushed the Masango into the nearby forest. "The Masango meat and honey gave way to Anuak fish and corn, that is, hunting to fishing skills", as Alan R. Tippet (1970, p. 60) points out. Gradually, together with fishing the Anywaa people learned hunting, cultivation, and domestication of animals. The total population of Anywaa in Ethiopia is approximately half-a-million, excluding those in the Sudan.

As mentioned above, the major occupations of the Anywaa people are agriculture, fishing, and hunting. Various aspects of their economic and social life are reflected in their oral poems and sayings. Thus, a lion's share of their orature is related to fishing and hunting, but this study concentrates only on those proverbs which are directly related to animals commonly found in their area. The Anywaa proverbs tell us about their society, occupation, relationships, day-to-day life, and so on. They are historical evidences of community ethics, moral, and world views. In fact, they serve as corrective forces among the members of the society, by giving them time-to-time warnings against the impending social hazards.

The Anywaa inherit a great treasure of oral literature. They perform them during gatherings called 'Wimaach', a sort of get-together around a bone-fire before dinner. When guests or relatives visit a family house, all male members lit a fire and sit around it, waiting for their food to be prepared by the female members. Usually they spend about four hours, from 6 pm to 10 pm, and the leader of the group, called Kora, recounts stories related to Anywaa history, which tell of wars and tribal feuds or of 'economic' issues, such as cultivation, hunting, and fishing.

A commonly performed story is that of the origin of kingship among the Anywaa. Once a young and beautiful Anywaa maiden named Akango went to a nearby fish-pond to fetch water. She saw a young, strange-looking person sitting by the side of the pond. She informed her parents of this matter, and they scolded her for not inviting him to their house. The next day, she noticed the stranger again and invited him to her house where he was welcome. When Korri, the mother of Akango, gave him food, he refused to eat it. Later Akango herself gave him food and water and he accepted. The young man's name was Ochudho and he stayed with them for a few weeks. Their relationship became stronger and Akango became pregnant. When Ochudho came to know this, he gave her a garland of five turquoise-blue beads and went back to the fish-pond. Nobody saw him later, for he might be the spirit of the fish-pond. Akango delivered a boy-child who became the first king of the Anywaa people. Even today, at the time of the coronation, the Anywaa king is given the garland of those beads, as a token of his authority.

Another occasion for using oral literature, especially proverbs, is a general meeting of the people, called 'Achonga'. There orators use a number of proverbs in their speeches in order to make their arguments emphatic and powerful. It must also be recalled here that the Anywaa frequently use proverbs in their daily conversations.

According to Mengistu Melakneh (2009), "The term oral literature refers to verbal art of traditional cultures usually composed orally and transmitted from generation to generation by word of mouth" (p. 9). This suggests that the 'writing' of oral literature changes its performance. However, unlike other genres of oral literature, proverbs have little or no chance for time-to-time changes which occur in accordance with the whims and fancies of the performers. In other words, if a performer changes the structure of a particular proverb, it will lead to the creation of another proverb so that the proverb becomes two proverbs, instead of one. Therefore, the present paper concentrates particularly on proverbs in a manner that does not upset their authentic effect and flavour. It is also hoped that this study of proverbs will help in promoting their preservation for future generations.

PROVERBS RELATED TO ANIMALS

There are a number of proverbs and sayings related to animals, both domesticated and wild, which are actively used among the Anywaa. They are classified and presented below alphabetically in accordance with the names of the animals.

Antelope
Tääng dee døø ii dwaar tøanga ba da nyää dëëre. Tääng (antelope) *dee døø ii* (again) *dwaar* (hunting) *tøanga* (my spear) *ba da nyää dëëre* (wouldn't bother)! If the antelope went to the opposite direction of the hunting place, I wouldn't bother about my spear. The hunter regrets if the antelope goes away from the hunting place. This saying is used to express one's regret when people accuse somebody. It is like saying: If I knew such bad things happened, I wouldn't go to that place. Sometimes, the elder of a village is severely criticized for his decisions by others in your absence, and then you would say, "If I were he, I

wouldn't become the elder!". This proverb is an archaic expression of it.

Cat
Ngäc løw opäära adhuri ki yie. Ngäc (know) *løw* (which side) *opäära* (jump) *adhuri* (cat) *ki yie* (place). Know which side the cat jumps. This means that one should know the pros and cons of a matter before taking a decision on anything; one should be aware of the consequences of the decision.

Cow (and Calf)
Dhir nywaak ba week dhöödhö. Dhir (cow) *njuwaak* (sharing) *ba week* (can't give) *dhöödhö* (milk)! To share the food, prevent the calf from drinking the cow's milk! It means that if everyone co-operates in farming, the benefit is shared by all. It is the responsibility of every individual to protect public property for the benefit of the community. The Anywaa cultivate corn and keep domesticate animals. In their oral literature, references to pastoral life and farming are quite common. Another proverb related to cow is: *Dhieng cwoba ri nyilaal. Dhieng* (cow) *choba* (stab) *ri ngilaal* (through a child)! The cow struck the child. You do something pretending that it is for your child. For example, when you starve, you collect food in the name of your child, because you are ashamed to say that your family is starving. In other words, when you are in dire need of money, you borrow it from somebody saying that it is for the child wounded by the cow! Another proverb on cow is: *Dhira angany jaala wanni dëëri. Dhiira agany* (Agany's cow) *jela* (care) *wanni deere* (the owner to it)! The owner looks after Agany's cow! It means that each one should care for his work. It the owner doesn't look after his cow, who else will look after it? He who works for something is the owner of that thing. Another meaning is that if you do your work, others will come and help you. The owner of the cow should begin the construction of the cowshed or house; then, others will come and help them to complete the work.

Crocodile
Nyaang ba buut wøk jaak. Nyaang (crocodile) *ba buut* (can't sleep) *wøk jaak* (outside)! A crocodile sleeps only on the river-banks! It means don't do anything without knowing the way to escape from its adverse result, or else, you will suffer the consequences. The Anywaa people use some of their proverbs even in their common conversation. Some of them have didactic effects and contribute to entertainment. Another saying related to crocodile is: *Nyaang caama dïpööy. Njyang* (crocodile) *chama* (eat) *dipooy* (teacher)! Crocodile ate the teacher! A preacher of morality caught up in immoral traffics. Another saying indirectly related to crocodile is: *Kar tier jwöthï japi. Kar tier* (don't) *juothi* (armpit) *japi* (open)! Don't open your armpit. Let not your own deeds turn against you! To find its relation to animals, I asked one of my Anywaa students to explain it and he told me a tale. A crocodile was afraid of *guur*, a huge fish found in the Baro, until the *guur* revealed that it had no teeth, and the next day the crocodile swallowed the fish. So the proverb warns that it is dangerous to reveal your weaknesses to others.

Deer
Luubö atimö ni cwiek tiedo. Luubö (speech) *atimö* (becomes) *ni cwiek* (soup) *tiedo* (deer)! The speech is Tiedu's soup. When somebody makes a wonderful speech, you exclaim like this. The speech was as tasty as the soup made with

the meat of *tiedu* (a kind of small deer). The speaker's words are very healthy and useful.

Dog
Gwök kwanynya ri wääth ki cöö. Gwök (dog) *kwanynya* (take) *ri wääth* (by walking) *ki cöö* (bone)! Unless the dog searches, it won't get the bone! The dog can find its favorite bone if only it is ready to walk a long distance. Unless you move from place to place, you won't get any benefits. It advises you not to expect benefits to come to you if you are not ready to try for them. The hunters used to move from one place to another to find the game. Lazy people will starve. Another saying related to dog is: *Gwök ma mägö ki lääy ngic ki tiete. Gwök* (dog) *ma mägö* (which catch) *ki lääy* (animal) *ngic* (is identified by) *ki tiete* (its legs)! A good hunting dog is identified by its legs! It means that one can easily identify a capable man through observation. Another proverb says: *Gwök ba guuyi jaak. Gwök* (dog) *ba guuyi* (can't bark) *jaak* (nothing)! A dog cannot bark at nothing! One cannot say something without any reason. In other words, if somebody says something about someone, there will be a reason behind it.

Elephant
Liec thöra apøøte. Liec (elephant) *thöra* (is finished) *apøøte* (piece by piece)! An elephant can be finished by taking it piece by piece! Nobody can finish an elephant as such, its body must be cut into pieces. It means that the big work should be finished bit by bit. So, piecemeal work is recommended for difficult tasks.

Goat
Atea dhie jeeya koodhi. Atea (goat) *dhie* (mouth) *jeeya* (ignores warning) *koodhi* (thorn)! The goat that ignores warnings gets the lesson from the thorns! If you do not listen to the advice given by elders, you will learn by suffering the consequences of your deeds, like the goat that eats thorny plants, gets its mouth injured by thorns.

Hyena
Odiek pëëte nøk. Odiek (hyena) *pëëte* (skins) *nøk* (few)! Scarce are the hyena's skins! It means that fear will protect one from danger. Hyena runs away from human beings like a coward, but cowardice saves its life. One can't find hyena's skin at home because it is a coward. There is also an alternative explanation. Being afraid of hyena, nobody hunts it, and its skin is rarely available. In hunting one must be courageous but that does not mean that you must be fearless! Too much courage and overconfidence is dangerous. Another proverb related to hyena is: *Angwala ni toor baam odiek. Angwala* (imitation) *ni toor* (which break) *baam* (hip-bone) *odiek* (heyana)! Hyena pretends as if its hip-bone is broken. When a hyena walks, the hind legs lean to a side as if imitating an animal that has a broken hip! The proverb warns against imitating another person's doings because you will be caught in your action.

Leopard
Kwac kit moe ba wiile. Kwac (leopard) *kit* (spots) *moe* (it) *ba wiile* (can't change). A leopard can't change its spots. This means that it is difficult for a hard hearted person to change the basic nature or his/her personality traits.

Monkey
Ajwomi nø kwääka wï thuurë. Ajwomi nø (every monkey) *kwääka* (plays in) *wï thuurë* (its place)! Every monkey plays in its own place. It means that everybody feels free, relaxed, powerful and authoritative in his own place. When you are in a strange place, you cannot fight even against injustice. Another proverb related to monkey is: *Ajwom ba buut bäät cwa. Ajwom* (monkey) *ba buut* (won't sleep) *bäät cwa* (on the tamarind tree). The monkey won't sleep on the tamarind tree. The sour-tasting tamarind fruits are the favorite food of monkeys. The proverb means that one should not sleep in the barn. If you sleep in the room where the food is kept, you may continue eating and thus keep nothing for the next day. The proverb reminds of preserving things for future.

Mouse
Ngat dhee ongïc acela thaac waange waange ni kweelø. Ngat (anyone) *dhee ongïc* (who is a customer) *acela* (to mouse-meat/bush meat) *thaac waange waange* (will burn) *ni kweelø* (a ball made of dry-grass—kept between the head and the head-load)! One has to burn even his grass-hat to taste the mouse-meat! To get benefit, use whatever measures you have. To smoke out a rat from its hole, don't go away in search of dried grass, but use the grass of your 'support-hat' which you made to keep in between your head and the load on your head. A number of Anywaa proverbs and sayings are related to hunting and cooking of bush-meat. This proverb teaches that in hunting, quick, timely action is crucial.

Musk-cat
Kwøro wïïr ki maar dëërë. Kwøro (musk-cat) *wïïr* (fragrance) *ki maar dëërë* (by its own oil/secretion)! A musk-cat makes itself sweet smelling by its musk. The saying means that one can become well-known or famous by his/her own abilities. One should utilize his/her talents or capital in a more beneficial way.

Tiger (and Wild Cat)
Pääri ki dum kwøro kanyo poode ni kwac poot naanga ree. Pääri (jump) *ki dum kwøro* (with muscat's skin) *kanyo poode* (before) *ni kwac* (a tiger) *poot* (isn't yet) *naanga* (licking) *ree* (itself)! Jump with the wild musk-cat's skin before the tiger licks its own skin! This proverb is a complicated one. Both the big tiger and the small wild cat lick their own skins, as if to get courage for the next jump. It would be better if the cat licked the larger skin of the tiger. Then, the cat will get the courage of the tiger. It means that before you plan to do a small thing, you must have greater preparations. Though your forthcoming work might be small, prepare as if it is a big work, then you will be able to complete it very easily. The proverb has another meaning too. Do things according to your ability or don't do bigger things until you have the capacity to do them. The cat should lick its own skin and not that of the tiger!

Tortoise
Ocirö cäädhi ka akwaane. Ocirö (tortoise) *cäädhi* (walk) *ka* (by its) *akwaane* (shell)! A tortoise walks with its shell! Learn the lesson from the tortoise that carries its own house (shell) wherever it goes. One must go for a journey with

all the necessary things. In other words, don't expect to live with another's property.

Wild Boar
Obang ko Omøt gena apät cøøyø. Obang (name of a person) *ko* (and) *Omøt* (another person) *gena* (are) *apät cøøyø* (spoons and fat of wild boar)! Obang and Omot are intimate friends. The spoon and the fat of wild boar love each other. When you cook the meat of wild boar, its fat will stuck on the ladle. This proverb is used to point out the intimate friendship between two persons. Their friendship is inseparable like the ladle and the fat on it. Another proverb related to wild boar is: *Aana purö ki puur kul. Aana (I) purö* (tilled/cultivated) *ki* (like) *puur kul* (wild boar's cultivation)! I tilled like a wild boar. Usually wild boars come to the field and upturn the soil or plough the land with its tusks in search of some edible roots but in vain. This proverb is used to express one's own despair when facing a loss in cultivation. You have invested your energies in cultivation but, as there was no rain, no benefit came out of it and hence your work was like the useless tilling of the wild boar.

CONCLUSION

It was man's desire for self-expression, his interest in people and their doings as well as his observation of the world in which he lives and the world of imagination he hopes to bring that inspired him to produce literature. His feelings, thoughts and experiences, his reactions towards the happenings around him and his practical responses to problems he faces forced him towards this creative activity. Moreover, man's instinctive desire to tell others about his unique experience stimulated him towards the production of imaginative literature which, as Meyer points out, "is a source more of pleasure than of information" (1994, p. 46). In the case of the Anywaa the proverbs represent their culture. By analysing the Anywaa orature we can find out how this literature influences the day-to-day life of the people. Until recent days, when writing was slowly introduced into their society, the Anywaa presented their ideas and thoughts through stories and songs, with the accompaniment of impressive gestures and, later, of musical instruments.

Ethiopia has a number of small ethnic groups, each one with a language and culture of its own. Their oral literature, if brought into limelight, will turn into an asset for the world literature. It is high-time that the government and other social organizations take appropriate steps towards protecting and saving their oral literature lest the age-long accumulation of this heritage vanishes in the present surge of modernization. It is often argued that the 'writing' of oral data changes its performance. Yet, it is my contention that such instances of orature as proverbs cannot be changed by a performer. Therefore, the preservation of proverbs and other genres of orature in their written form can be valuable for the future generations.

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ORIGINAL ARTICLE

CORRELATES OF JUVENILE DELINQUENCY AMONG JAILED DELINQUENTS IN GONDAR, ETHIOPIA

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ABSTRACT

This study investigates the relationships among neighborhood condition, school problems, parent adolescent communication, peer relation and religiosity on juvenile delinquency. Self-reported questionnaires were collected from 107 juvenile delinquents aged 11-18 years. Six standardized instruments of Amharic versions were administered. The rate of juvenile delinquency was significantly and positively correlated with the neighborhood condition, school problems, poor family communication, and peer relation. Negative significant relationships were also observed between juvenile delinquency and religiosity and open family communication. All variables together accounted for 88.6 % of the explained variance. More specifically, the strongest influence was from neighborhood condition followed by open family communication and school problems. The paper concludes that to tackle delinquent behavior proactive interventions are essential at family, school and community levels.

Keywords: correlates, juvenile delinquency, jailed delinquents, Gondar Correction Center.

INTRODUCTION

Juvenile delinquency is a recognized social problem across many societies (Junger-Tas et al., 2010) and a popular issue of social research. Juvenile delinquency can be defined as illegal behaviors of a person under the age of 18 (The Cambridge Dictionary of Psychology, 2009). It encompasses a range of norm-breaking behaviors for which adolescents are criminally responsible such as, among other instances of delinquency, drug use, violent offenses against other persons and carrying weapon (Marte, 2008). It has been found that most of the criminals began to engage in criminal act at the age of thirteen years (Steve, Maurice, Veronica & Jane, 2005).

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There is no universally accepted definition of juvenile delinquency at least for two reasons. First, the minimum age for criminal responsibility varies from country to country (e.g. 7 in Sudan, 9 in Ethiopia or 18 in Belgium). Second, some of the behaviors identified as juvenile delinquency such as use of alcohol or not attending the school in some countries are not illegal in others.

Juvenile crimes slow down the development of a society and cause major distress and damage to victims, perpetrators, and the society at large (Nas, DeCastro & Koops, 2005; Shamim, Batool, Zafar & Hashmi, 2009). Adolescent crime has been studied using many labels. The most common label that has been used is delinquency. The study of delinquency literature highlights the role of some prominent factors, the most important of which are family-related and peers factors (Brendgen et al., 2000; Pearce & Haynie, 2004). Among family process variables, parental monitoring has been identified in the literature as one of the proximal determinants of early development and maintenance of antisocial and delinquent behavior in children and adolescents (Singer, Flannery & Guo, 2004). Others indicate socio-economic conditions, especially poverty, are of the prime importance in a young person's life (Nisar, Ullah, Ali & Alam, 2015).

Psychologists, sociologists and criminologists the world over have long debated on the various causes and determinants of delinquency (Nisar et al., 2015). Research findings on causes and contributing factors of juvenile delinquency are mixed, contradictory and inconclusive. Understanding the true cause of crime remains a difficult problem (Seigel, 2003). Searching for a single cause in crime studies often leads to wrong conclusions by attempting to deal with only parts of the issue. Such attempts would eliminate the possible causal explanation of a variety of phenomena. This view of causation is inappropriate because of the existence of multiple causes or factors in human behavior (Shoemaker, 1996). Indeed, it is quite difficult to identify a single factor that independently determines the features of a crime. Only possible explanations could be provided on the identifiable aspects of crimes (Nega Jibat & Berhanu Nigussie, 2015).

Taken all together, at different setting and situations there are different reasons for juvenile delinquency. This also holds true in the present study site, where the possible factors have not been well investigated yet. Consequently, there is a need to examine correlating variables of juvenile delinquency in the Ethiopian context.

Correlates of juvenile delinquency

The family is believed to be the most significant agent of socialization and to have a positive impact on the behavior of its members through open communication of values, beliefs, norms and other codes of conduct. The reverse might be true for those families characterized by potential theft, vandalism or robbery. Such families may at least indirectly instruct their members to behave in their traditional way (Regoli & Hewitt, 2006). Additionally, it is believed that families which are characterized by poor communication among members may fail to teach their members what is

believed to be good conduct.

Scholars in psychology and sociology have demonstrated the impact of peers on adolescent behavior. For instance, Regoli and Hewitt (2006) revealed that having peers who are involved in delinquent behavior is the most significant predictor of juvenile delinquency. Similarly, Regoli and Hewitt (2006), summarized studies of religiosity which depict mixed results. Some revealed that religiosity is negatively related to delinquency while some others claimed that there is no link between religiosity and delinquency. However, a meta analysis of 60 scientific studies conducted over the last 30 years showed that religiosity can have significant deterrent effect on criminal behavior. Juvenile delinquency is also assumed to be determined by the extent of juvenile bond with their social settings such as schools. This assumption is held by social bond theory. This can be seen in terms of the attachment of juveniles to their school. Regoli and Hewitt (2006) have stated that children who like their school conform to its rules and regulations and are less likely to commit crime. Several other studies argue that neighborhood conditions such as social structure, bond to school and control determine juvenile delinquency. For instance, Sampson (1997) found that neighborhood control is significant inhibitor of adolescent delinquency. Social disorganization (i.e. social structure) is also strongly related to juvenile violence (Rhodes & Jason, 2005).

To date, very limited effort has been made to characterize the situation of juvenile delinquency and its correlates in Ethiopia. This study aims at opening social science research in Ethiopia to this important area of study and therefore turning into the stepping stone to assess the correlates of juvenile delinquency in the Ethiopian context. In this study, correlates of juvenile delinquency refer to factors associated with criminality. They include only juvenile family interaction, peer influence, neighborhood, bond to school, and religiosity.

Local studies on juvenile delinquency

The literature on criminality and related issues in Ethiopia is scant. Moreover, the studies available mainly focus on adult criminality and disregard juvenile delinquency, while using secondary data, and charactering profiles of criminals (e.g. age, gender, occupation, educational level and marital status). Hence, no detail of personal offender or victim is obtained which, in turn, hampers statistical manipulation to determine relationship between crime and its correlates (Nega Jibat & Berhanu Nigussie, 2015). Besides, most of these studies are conducted in the Oromia region and in Addis Ababa (e.g. Andargatchew, 1988, 2004; Daniel Wondimu, 2004; Nega Jibat & Berhanu Nigussie, 2014, 2015).

For instance, Nega Jibat and Berhanu Nigussie (2014, 2015) analyzed secondary data in the Oromia region. The total number of criminals reported in their study was 96,300 (2011/2012), 85,100 male and 11,200 female offenders. About 37% of those criminals committed violent crimes. The ratio of male to female offenders was 7.6:1. The dominance of male over female both in criminality and victimization is the extension of their social position with

the social structure and the result of gender role socialization. Age group 19 to 30 was found to be the most criminal population with the criminal rate of 828 per 100,000 people. Unfortunately, the relationship between educational statuses, types of occupation/employment and marital status, on the one hand, and criminality, on the other, were less than conclusive mainly because of the lack of adequate information on such variables for individual criminals and victims or the fact that police data consisted only on aggregates. Victimization rate was higher for males and for the 31-50 age categories (Nega Jibat & Berhanu Nigussie, 2015).

In the present study area there are many juvenile adolescent in the correction center and the problem also exists in the youth population. Nevertheless, no study on the correlating factors of adolescents' criminal act has been conducted or published. This has also hampered devising any intervention to tackle this social problem. For this reason, it is a pressing need to investigate empirically this issue and to suggest feasible interventions. The very purpose of this study is to fill this gap and to address the following questions: What is the relationship between juvenile delinquency and associating factors (juvenile family communication, bond with school, peer relationship, neighborhood condition, and religiosity)? Which one of the above proposed factors influences juvenile delinquency at most?

METHODS

The major purpose of this study was to assess associating factors of juvenile delinquency employing correlational study design. The study was conducted in Gondar, north western Ethiopia. Samples were taken from one of the largest correction centers in the city. Although, the correction centre mainly hosts adult offenders, a significant number of juvenile offenders who were less than 18 years old are jailed together with adults. Among the 2,060 inmates of this correction center, 110 of them were below the age of 18. About 110 juvenile were taken for this study.

There were about 81 males (78.2 percent) and 26 females (21.8 percent) in the sample. The age range was from 11 to 18 years, with M = 14.25, SD = 3.04 for males and M = 16.90, SD = 1.77 for females. More than half (57.94%, 62) of the respondents were second cycle students (grade 6, 7 and 8) while 37.38% (40) of the respondents were first cycle students (grade 4 and 5), and the remaining 4.67% (5) were illiterates. Except for five respondents (who were daily laborers), all respondents were (95.23%, 102) students.

Measures

Juvenile-family interaction

To measure juvenile-family interaction, the parent-adolescent communication scale (PAC) of Barnes and Olson (1982) was adopted. The scale consists of two subscales: 1) open family communication, which measures positive aspects of parent adolescent communication and 2) problems in family communication, focusing on the negative aspects of communication. The scale consists of 20 items, for example: "My mother/father is always a good listener" and "My

mother/father insults me when she/he is angry with me". The items are arranged along a 5-point Likert-type scale and respondents rate themselves on each item, from 1 = strongly disagree to 5 = strongly agree. In the present study PAC scale has Cronbach α = .87 for open family communication, Cronbach α = 0.78 for problems in family communication and Cronbach α=0.82 for the global scale.

Peer relationship
To measure the level of pressure of peer relation, problem with friends' subscale of the Multi Problem Screening Inventory MPSI (Hudson, 1990) was adopted and used. Sample items were "I get along very well with my friends" and "My friends act like they do not care about me". The items are arranged along 8-point Likert-type scale and respondents rate themselves on each item, from 1 = none of the time to 7 = all of the time and X = does not apply to me. Its reliability is Cronbach α=.80 for this subscale. The subscale produces a score ranging from 0 to 100 where a low score indicates the relative absence of the problem being measured, and higher scores indicate the presence of a more severe problem.

Neighborhood condition
To measure this variable the neighborhood subscale of the multi problem screening inventory (Hudson, 1990) was adopted and used. Sample items were "I really feel that I am disliked by my neighbors" and "I wish I had a different group of neighbors". The items are arranged along 8-point Likert-type scale and respondents rate themselves on each item, from 1 = none of the time to 7 = all of the time and X = does not apply to me. Its reliability was Cronbach α = .80 for this subscale. This subscale produces a score ranging from 0 to 100 where a low score indicates the relative absence of the problem being measured, and higher scores indicate the presence of a more severe problem.

Problem with school
To measure this variable the problem with school subscale of multi-problem screening inventory (Hudson, 1990) was adopted and used. Examples for items include "I hate school" and "I enjoy my school work and studies". The items arranged along an 8-point Likert-type scale and respondents rate themselves on each item, from 1 = none of the time to 7 = all of the time and X = does not apply to me. Its reliability was Cronbach α = .80 for this subscale. This subscale produces a score ranging from 0 to 100 where a low score indicates the relative absence of the problem being measured and higher scores indicate the presence of a more severe problem.

Religiosity
To measure religiosity, the spiritual assessment inventory (SIA) developed by Hall and Edwards (1996) was adopted and used. The scale consists of seventeen items. Examples for items include "I have a sense of how God is working in my life" and "God's presence feels real to me". The items arranged along 5-point Likert-type scale and respondents rate themselves on each item, from 1 = Not at all to 5 = Very true. The reliability of each subscale was

estimated using Cronbach's coefficient alpha measure of internal consistency. Its reliability was Cronbach α = .89 for this subscale.

Juvenile delinquency
To measure this variable, frequency of delinquent behavior scoring Iinstrument (FDBSI) developed by Centers for Disease Control and Prevention, National Center for Injury Prevention and Control (2005) was used. The scale consists of twenty five items. Examples for items include "Cheated in school tests" and "Taken something from a store without paying for it". The items arranged along 5-point Likert-type scale and respondents rate themselves on each item, from 0 = Never to 4 always. Its reliability was Cronbach α = .80 for this subscale.

Procedures
This research was totally based on the consent of participants and willingness of North Gondar Correction and Gondar University administrative bodies. At the outset, the researcher gave brief orientation about the objectives of the study, the instructions of the tool and assured confidentiality to the respondents.

Data collection was done in collaboration with different people in the correction centers such as, the administrator, the guards and lawyers. But, before the administration of the questionnaire to the inmates, training was given to the coworkers who helped in data collection processes. Respondents were also told that they had the right to withdraw whenever they felt discomfort at any time. They were also assured of the anonymity of the responses and their responses would be only used for research purpose. The questionnaire was translated and presented in an Amharic version. A pilot test was conducted so that the questionnaire attains a desirable level of validity and reliability.

Analysis
Pearson Product Moment Correlation was used to see the relationships among the variables (family juvenile interaction, peer relation, neighborhood condition, bond with school, religiosity) and juvenile delinquency). Regression analysis was done to examine which factor was more decisive in influencing

Table 1: *Correlation between juvenile delinquency and associating factors*

	RJD	PWN	PWS	PWP	RWG	OFC
PWN	.888**					
PWS	.749**	.711**				
PWP	.761**	.674**	.709**			
RWG	-.357**	-.325**	-.207	-.245*		
OFC	-.818**	-.764**	-.574**	-.637**	.260*	
PFC	.812**	.756**	.583**	.658**	-.290**	-.772**

Note: *p< .05; **p < .01 n=107.

Table 2: *Regression results of study variables to predict rate of juvenile delinquency*

Variables	B	SE	β	R	R^2	F	t
Constant	-8.922	3.612		.941	.886	103.19**	-2.470**
TPWN	.246	.047	.387				5.276**
TPWS	.120	.049	.148				2.458**
TPWP	.197	.083	.142				2.358**
TRWG	-.028	.017	-.065				-1.626
TOFC	-.109	.036	-.203				-3.047**
TPFC	.093	.038	.164				2.455**

Note: *p< .05; **p < .0, n=107.

juvenile delinquency.

RESULTS

Table 1 showed that a statistically significant positive correlation emerged between rate of juvenile delinquency (RJD) and problem with neighborhood (PWN) (r =.888, n = 107, p < 0.01), problem with school bond (PWS) (r = .749, n = 107, p < 0.01), relationship with peers (PWP) (r = .761, n = 107, p < 0.01) and poor family communication PFC) (r = .812, n = 107, p <0.01). However, negative correlations are found between juvenile delinquency and religiosity (RWG) (r = -.357, n = 107, p < 0.01), and open family communication (OFC) (r = -.818, n = 107, p < 0.01).

Table 2 depicts how much of the variance in the dependent variable (TRJD = total rate of juvenile delinquency) is explained by the model (which includes the predictor variables of total of problem with neighbors TPWN, total of problem with school TPWS, total of problem with peers TPWP, total of relationship with God TRWG, total of open family communication TOFC and total of poor family communication TPFC). So these factors explain 88.6 percent of the variance in total rate of juvenile delinquency TRJD.

The table also shows that problem with neighbors (β = 0.387, F=103.19, t = 5.276, p <0.01), open family communication (β = 0. -.203, F = 103.19, t = 0. -3.047, p < 0.01) and problem with school (β = 0. 148, F = 103.19, t = 0. 2.358, p < 0.01) significantly influence juvenile delinquency in the first three ranks respectively. When we look at the beta column to find which beta value is the largest (ignoring any negative signs out of the front), PWN made the strongest unique contribution to explaining the dependent variable, when the variance explained by all other variables in the model is controlled for. The beta value for Total of RWG was lowest (β = 0.065), indicating that it made less contribution.

DISCUSSION

In this study there was a strong and positive rate of delinquency associated with high levels of problem with neighbors. This result is congruent with that

of other studies (Sampson & Byron, 1989; Sampson, 1997) that categorized the neighborhood effect as two dimensional, control and ties. These studies emphasize the importance of neighborhood ties as the main measure of neighborhood effect in addition to neighborhood control in explaining the impact of neighborhood context on crime.

Previous studies have established an association between neighborhood ecology and delinquency (Johnson, Larson & Jang, 2000; Sampson, 1997). Jang and Johnson (2001) found that perceived neighborhood disorder, which is a sign of lack of social control, is significantly related to adolescent use of illicit drugs, marijuana and hard drugs. Such similarity with other findings could be attributed to the similarity in study subject (juveniles) and neighborhood influence.

The present study found out a positive correlation between the rate of delinquency and the problem with peers. The finding is supported by previous studies like Wellman and Berkowitz (1988). Consistent with the premise of differential association theory, a great number of empirical studies have shown that there are strong associations between peer delinquency and delinquent behavior (e.g. Agnew, 2001; Jensen, 1995). Empirical studies also support that delinquent peers are related to both initiation and contribution of adolescents' delinquent behaviors (Matsueda & Heimer, 1987). Furthermore, Gottfredson, and Hirschi (1990), who are major supporters of the importance of social bonding in explaining delinquency, acknowledged the strong influence of deviant peers on delinquency. The significant association consistently evidenced in this research gives credence to the idea that delinquency is best understood in the context of the peer group where common norms and behaviors emerge from locations in structured patterns of relationships.

This study showed that there was a strong, positive correlation with high levels of rate of delinquency associated with high levels of problem with school. Not surprisingly, the effect of the school social bond on delinquency has generally been supported by previous studies (Hawkins, Catalano & Miller, 1992; Joseph, 1996; Krohn & Massey, 1980; Lawrence, 1985; Thornberry et al., 1991). One possible explanation in the present study is that the lack of attachment to school, less social bond and greater deprivation of rights may lead to more delinquency among participants.

The present study also showed the strong, negative correlation between juvenile delinquency and open family communication, with high levels of rate of delinquency associated with low levels of open family communication. In addition it established a strong, positive correlation between juvenile delinquency and poor family communication, with high levels of rate of delinquency associated with high levels of poor family communication. Clark and Shields (1997) stated that the importance of positive communication for optimal family functioning has major implications for delinquent behavior. A large body of theoretical and empirical research has supported these findings (e.g. Cernkovich & Giordano, 1987; Hirschi, 1969; Rankin & Wells, 1990; Stern & Smith, 1997). Even though there are various ways of conceptualizing

parental behavior in terms of types and dimensions, parental attachment (affective ties that adolescents form with parents) is considered the key construct of parenting (Hirschi, 1969). This strong relationship may be due to the fact that parental attachment functions as a social support and control in inhibiting delinquent behaviors. The bonding of the juveniles with their family members strongly influences the rate of delinquency.

There was also a moderate, negative correlation with high levels of rate of delinquency associated with low levels of religiosity. For example, Shield (1984) found supportive evidence for religion's deterrent effect on delinquency even when controlling for parental support and educational commitment. However, one previous study (Benda, 1995) revealed that the inclusion of six major demographic variables and social control variables does not change the impact of religious effect on property crimes and crimes against persons. Furthermore, the same author reported that the effect of religiosity increases for crimes against persons when demographic variables and elements of social control theory are included in the model.

Johnson, Jang, Larson and Li (2001) found empirical evidence of an independent effect of religious belief on delinquent behavior for a national probability sample even when controlling for elements of social control and social learning as well as socio-demographic variables. However, the impact of religiosity was partly mediated by social control and social learning factors. However, Elifson, Petersen and Hadaway (1983) found that the independent effect of religiosity was not statistically significant. Burkett and Warren (1987) also reported that the relationship between religiosity and delinquency becomes statistically nonsignificant after controlling for family and peer variables. They concluded that the impact of religiosity on adolescent drug use was not direct but operated indirectly through peer associations.

Thus, it is worth discussing the possible causes of the difference in findings between the present study and some previous ones. A plausible explanation is that the impact of religion on delinquency may vary by religion or denomination and the extent to which the religion disapproves of particular behaviors. For instance, many religions do not teach against alcohol use (e.g., Catholicism, Judaism). Furthermore, even if adolescents have religion, it is possible that they see religion as irrelevant to experimenting with smoking and alcohol. In this case, religious sanctions may not have a strong effect on delinquency.

To compare the contribution of each independent variable the beta values are important. When we look at the beta column to find which beta value is the largest (ignoring any negative signs out the front), the largest beta coefficient is for total of PWN and the strongest unique contribution to explaining juvenile delinquency, when the variance explained by all other variables in the model is controlled for. The beta value for Total of RWG was slightly lowest, indicating that it made less of a contribution. Most previous researches (Jang & Johnson, 2001; Johnson, Larson, Li & Jang, 2000; Sampson, 1997; Sampson & Grove, 1989) gave emphasis on associations rather than

predictors of juvenile delinquency. But in this study neighborhood situation is a strong influence for the rate of juvenile delinquency.

CONCLUSION

Juvenile delinquency has direct and significant relationship with poor family communication, peer relationship, school problems and neighbors. Religiosity and open family communication has negative significant relationship with juvenile delinquency. The strongest influence was from neighborhood condition compared to other factors covered in this study.

Parent-adolescent communication, school problems, neighborhood conditions, delinquent peer association and religiosity should be promoted through various mechanisms as an important determinant of juvenile delinquency. Involving the wider community in appreciating the significance of parent-adolescent communication and identifying interventions to enhance communication on delinquency should be considered.

This study was conducted based on the available sample of delinquents in Gondar Correction Center. Their total number, but for those who volunteered for the study, could not be established. As a result, the statistical assumptions and procedures might not keep for analysis and the results could not be extrapolated. Despite this methodological limitation, the results of this study at least do represent a certain reality about correlates of delinquency in north Gondar zone and the region. Future research should address larger samples to identify the specific contribution of each variable to juvenile delinquency and how different variables mediate and moderate it. Besides, interview should be carried out in order to know what the motivations are behind the delinquents engaging in criminal acts.

Declaration of conflicting interest

The authors declare no potential conflicts of interest with respect to the authorship and/or publication of this article.

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ORIGINAL ARTICLE

CROP SENSITIVITY TO INTER-ANNUAL CLIMATE VARIABILITY IN LAY GAYINT WOREDA, NORTHWEST ETHIOPIA

Addisu Baye[1] and Menberu Teshome[2]

ABSTRACT

Scientific evidence indicates that climate change has posed profound effects on the wellbeing of citizens in countries throughout the world. Its impact is even stronger on the poor having limited capacity to cope-up with it. In Ethiopia, climate change risks such as droughts, floods and other extreme weather events have threatened the overall sustainability of agricultural production and, in turn, the status of food security. The objective of this study is to examine crop sensitivity to inter-annual climate variability in Lay Gayint woreda, South Gondar Zone of Amhara Region. Simple regression and drought susceptibility indices were used to analyze the data. The statistical analysis of the climate data revealed an increase in temperature, and decrease and/or erratic distribution in rainfall. Based on these findings the paper encourages strategies that can enhance the ability of farmers and soil productivity. Additionally, water conservation projects with the active participation of the rural communities are considered as essential.

Keywords: climate variability, crop production, crop sensitivity, drought susceptibility

INTRODUCTION

Recent assessments indicate that climate change is already having an impact on crop yields across several regions of the world. Although positive impacts are observed in some regions, negative consequences are more common globally on aspects of food security, freshwater, health, nutritional quality and safety of food, biodiversity, and ecosystems.

Ethiopia is one of the sub-Saharan Africa countries situated in the Horn of Africa. Climate change and variability have posed critical implications for the country's agriculture, water, health and forestry. Indeed, Ethiopia is among the most vulnerable entities to climate variability and extremes, given that only a small proportion of its cultivated land used for food production is through irrigation (Temesgen Deressa et al., 2006). The majority of the population is engaged in rain-fed traditional farming systems and economic development is heavily reliant on agriculture, and natural resources, which are more sensitive to climate change. Thus, vulnerable livelihoods and national economic growth are likely to be highly affected by climate

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variability and extreme weather events can be expected to have adverse consequences on poverty reduction and development efforts (Girma Mamo & Fekadu Getatchew, 2010).

According to Girma Mamo and Fekadu Getatchew (2010), a recent mapping on vulnerability and poverty in Africa categorized Ethiopia in the group of the most vulnerable countries to climate variability and change with heavy dependence on agriculture (crops and livestock production). Climate variability and the resultant deterioration of natural resource bases have challenged Ethiopia's entrance to the new millennium with high hopes of a renaissance and a dream of better life for all citizens in the coming decades. Climate variability and change will continue to affect the country's agriculture, water resources, biodiversity and ecosystems. Hence, it will threaten the livelihood of the people; large sections of the populations residing in the lowlands and highlands will probably face increasing suffering in the coming decades (Seyoum Mengistu & De Stoop, 2007).

In Ethiopia, rain-fed dependent agriculture is very sensitive to fluctuation in climatic conditions. Even if productivity grew, climate change would still have a dramatic impact. The effects of climate variability on agricultural productivity may reduce the Ethiopian average income by as much as 30 percent within the next 50 years (Mahmud Yesuf et al., 2008). Moreover, it has led to shortage of food and increased human and livestock health risks, rural-urban migration and dependency on external support (National Meteorological Agency, 2007).

The Amhara region is known for its crop production in the country and is characterized by high rainfall from mid June to early September. Over 85% of the economically active population is engaged in the agricultural sector. However, some parts of the region, especially the northeast, are exposed to shortage of rainfall, which is less than 700 mm per year (Center for Disease Control and Prevention, 2008) and shortage of food throughout the year. Many *woreda*s located in North and South Gondar zones, East Gojjam and North Shewa administrative zones were surplus-producing areas before two decades. But now they have already become food insecure and highly vulnerable to climate variability (Melesse, 2007). Thus, out of the eleven *woreda*s of South Gondar administrative zone, five *woreda*s, namely Simada, Ibnat, Lay Gayint, Tach Gayint and Libokemkem, were considered drought-affected (Marye, 2011). Lay Gayint *woreda* is one of the areas where the localized temporal rainfall and temperature variation during cropping season induces an important challenge to crop production. According to the information obtained from the Lay Gayent woreda Agriculture and Rural Development Office (2010), extreme weather events such as increased flooding, droughts, insect outbreak, spreading of alien weeds, disease, and pests are aggravating food insecurity; in consequence, all communities need to enhance their adaptive capacity to combat the present and future challenges of climate variability and extreme weather events (Adger et al., 2003).

Several studies have shown that climate change has the potential to have a severe negative impact on human welfare, natural resources and development activities in the country (Alebachew Adem & Woldeamlak Bewket, 2009; Mahmud Yesuf et al., 2008; Temesgen Deressa et al., 2006). However, most of these studies were carried out at macro-levels. Unless the effect of climate variability is understood by the local people at the micro-level with the right perception, it would be difficult to convince and motivate local communities to undertake adaptation actions. Although the climate-change research community has identified different adaptation methods, the specific climatic characteristics of a particular area dictates the need for a specific adaptation method to climate variability and change. Moreover, the previous studies greatly focused on technology development without due consideration to climate variability.

Climate variability responsive research aimed at providing farmers with technological recommendations for adaptation has been up to the present typically very small. To minimize the impact and reduce vulnerability of the agricultural sector to the predicted change research aimed at evaluating and availing adaptation strategies at local and community level is an urgent priority. There is a need to monitor climate variability and integrate it with policies for research and development in order to prepare Ethiopia to the projected changes. An understanding of the local effects of recent climate trends on crop yields will help to anticipate effects of future climate variability on food self-sufficiency of the study area. This study will examine crop sensitivity to inter-annual climate variability in Lay Gayint woreda, South Gondar Zone of Amhara Region.

STUDY AREA

The study was conducted in Lay Gayint *woreda*, which is located in South Gondar Zone of Amhara Regional State. It is one of the ten *woreda*s of South Gondar zone covering an area of 1320.31 km^2 and sub-divided into twenty nine rural and two urban *kebele*s (the lowest administrative tier in Ethiopia). The *woreda* is bordered by Mekiet *woreda* in the east, Ebinat and Bugina in the north, Estie and Farta in the west and Simada and Tach Gayint in the south. The *woreda* lies within the geographical grid coordinates of 11°32'-12°16' N latitude and 38°12'-38°19' E longitude (Lay Gayint woreda Agriculture and Rural Development Office, 2011).

The total area of the *woreda* is about 154,866 hectares with a crude population density of 157 persons per km^2. The area has very steep valley and incised stream channels with slopes ranging from 30.5% to 50%. The major land use patterns of the study area comprise cultivated land (44.32%), grazing land (14.31%), forest/bush land (5.26%), water body (2.38%) infrastructure and settlement (5.92%), and unproductive land (28.44%) (Table 1).

The topography of the *woreda* is mostly characterized by a chain of mountains, hills and valleys extending from Tekeze Gorge (1500) to the

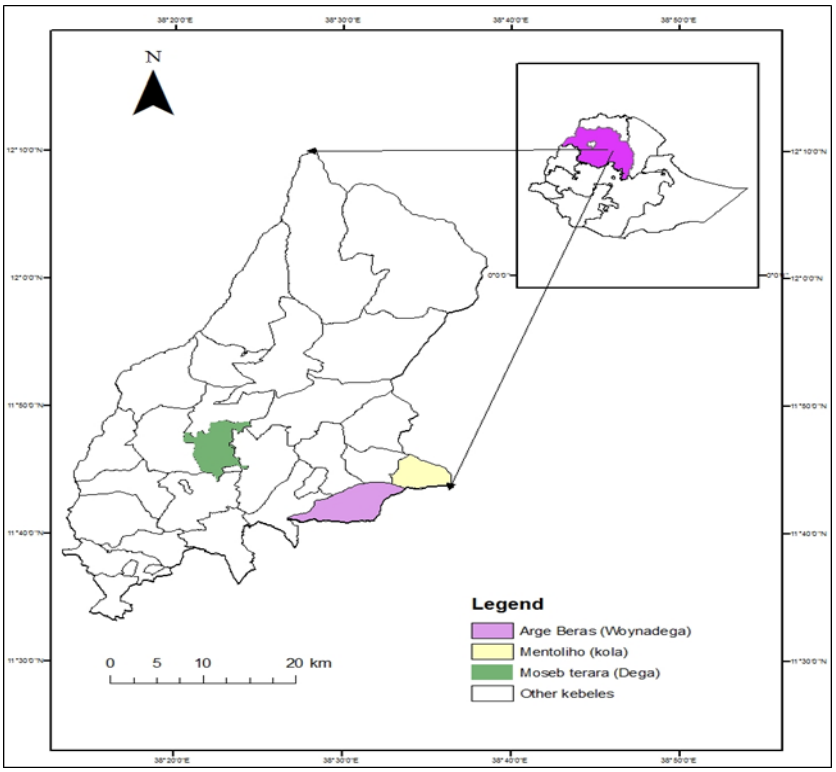

Figure 1: *Location map of the study area*
Source: Computed based on Ethio-GIS database.

summit of Guna Mountain (4230 meters above sea level). It is characterized by flat (10%), 50% undulating (50%), mountainous (15%) and gorges and valleys (5%). Agro-ecologically, the *woreda* is divided into four elevation and temperature zones, namely: lowland (*kolla*) (12.5%), midland (*woina-dega*) (39.42%), highland (*dega*) (45.39%), and *wurch* (very cold or alpine) (2.71%).

Table 1: *Distribution of land use/cover of Lay Gayint* woreda

Land use type	Ha	%
Cultivated land (annual crops)	68,649	44.32
Grazing land	22,160	14.31
Bush and shrubs	8,150	5.26
Water body	3,665	2.36
Uncultivated land	44,041	28.44
Infrastructure, settlement & others	8,201	5.29
Total	154,866	100.0

Source: Finance and economic development program of south Gondar, 2010.

Most of the rural population is settled on the highlands and plateau areas (South Gondar Zone Information and Communication Office, 2010).

The annual mean minimum and maximum temperatures range from 8° C to 29° C. The long-term average rainfall is 635 mm and is characterized by high variability and uncertainty. Problems of deforestation, overgrazing, poor quality soil, and lack of water conservation measures have contributed to the prevalence of drought in the *woreda*. The main rainy season occurs between June and September which represents the long rainy season (*meher*) and the small rainy season (*belg*) occurs between March and May. For crop production the highland areas (*dega*) depend in most cases on *belg* rain whereas the *woina-dega* and *kolla* areas depend on *meher* rain (Lay Gayint woreda Agricultural and Rural Development Office, 2010).

Most of the people in the *woreda* are engaged in mixed agriculture (crop cultivation and livestock rearing). Crop production is entirely rain-fed, except in very specific and small areas where vegetables are cultivated using traditional and small-scale irrigation. The most commonly produced crops in the study area are annual crops such as, wheat, teff, maize, sorghum, barley, chickpea, beans and oil crops.

The main soil types found in the *woreda* are brown (55%), red (15%), black (15%) grey (10%) and other soil types (5%) (Lay Gayint woreda Agricultural and Rural Development Office, 2011). The agricultural activity in the area is not productive because of the recurrent natural calamities. Natural resources are deteriorating and soil erosion is marked by the presence of expanding gullies. Rapid population growth has resulted in shrinking farmland sizes and grazing lands. Land degradation, moisture shortage, ground and surface water depletion, increasing infertility of soil and natural hazards like drought, landslide, incidence of crop pests and weed and livestock diseases, coupled with cultural and attitudinal factors are among the major problems in the study area. All these, in turn, have made the *woreda* one of the food insecure areas of the Amhara National Regional State (Lay Gayint woreda Agricultural and Rural Development Office, 2011).

DATA AND METHODS

Lay Gayint *woreda* has 29 rural *kebele*s found in different agro-ecological zones. Therefore, we used stratified, simple random and systematic sampling techniques to select the sample *kebele*s and household heads. Stratified sampling helped us to group *kebele*s within the same agro- ecology (*dega, woina-dega* and *kolla*) and then simple random sampling was used to select the three sample *kebele*s from each agro-ecological zone. These were Moseb Terara (*dega*), Arge Beras (*woina-dega*) and Menteleho (*kolla*).

Considering the homogeneity of the population in each agro-ecology, time, finance and other resources, a total of 200 household heads were taken from the selected *kebele*s for questionnaire survey. To determine the sample size

for each *kebele*, the statistical formula of Tare Yamane referred in Israel (1992) was used. The total sample size was allocated for the three *kebele*s using probability proportional to size method by the following formula:

Where, ni= the total sample for ith stratum

$$Ni = \frac{\mathbf{Ni\ (S)}}{\mathbf{\sum N}}$$

Ni= represents total households of each *kebele*

S= refers total number of sampled household in the study area

∑N =refers to Summation of total number of households in the study area

The list of households registered was obtained from the representative *kebele* administrations and local development agents. From these the sample households were obtained using systematic random sampling method.

Two research designs (cross-sectional and longitudinal designs) and two data sources (primary and secondary sources) were employed to generate data for this study. Cross-sectional designs were followed to gather information from farming households using a questionnaire survey at a point in time. Longitudinal designs were used to record monthly climatic values from the Ethiopian National Meteorological Agency and other governmental and non-governmental offices. The primary data were gathered

Table 2: *Distribution of sample* kebele*s and household sample size*

No	Selected *kebele*s in the study areas	Agro-ecological zone	Number of population	Number of household heads	Sampled household heads
1	Moseb Terara	Highland (*dega*)	4410	682	84
2	Arge Beras	Midlands (*woina-dega*)	5835	767	94
3	Menteleho	Lowlands	1092	182	22
Total			11,337	1631	200

Source: Lay Gayint woreda Agricultural and Rural Development office, 2011.

from January to February (2012) using structured questionnaire surveys of 200 rural households, field observations and key-informant interviews. Secondary data used in the research were assembled from both published and unpublished sources available at different government offices. The major data in this case was a longitudinal time series monthly precipitation record (1980-2010) based on daily data for gauged stations obtained from the Ethiopian National Meteorological Agency (Bahir Dar Branch) and crop production and land-use data from the w*oreda* Agriculture Office.

The data gathered through different methods were analyzed using descriptive statistics (mean, percentage) and drought susceptibility index. Draught susceptibility index (DSI) was used to analyze the collected data to predicted yield stability of different crops, resulting from the yield difference between strain and non-strain situation. DSI was calculated on the bases of differences between yields under non-stress condition to the stress conditions based on Rashid et al. (2003).

$$DSI=(1-YdYn)/D$$

Where, DSI = Drought susceptibility index, Yd = average yield of each crop under drought and Yn = average yield of each crop under non-drought/ normal conditions. While $D = 1 - (\hat{Y}d/\hat{Y}n)$, whereas D is environmental pressure/strain, $\hat{Y}d$= average yield of all crops under drought and $\hat{Y}n$= average yield of all crops under non-drought/normal conditions. This index provides a measure of relative drought tolerance based on minimization of yield loss under drought. Values >1.0 indicate greater than average drought susceptibility while values <1.0 indicate greater than average drought resistance. This was analyzed with the Statistical Package for Social Sciences (SPSS) and Microsoft Excel.

RESULTS AND DISCUSSION

Agricultural and farming practices

Like in many parts of Ethiopia, the farming system in the survey sites is still very much traditional relying on plough and yoke (animal-drawn power). It thus demands major means of labour production during land preparation, planting and post-harvest processing. It is also evident that out of the total sample households, 54.5% practice crop farming while 40.0% practice mixed farming (Table 3). The remaining 4.0% of the respondents were involved in other activities.

The agricultural sector in Ethiopia is the mainstay of the economy. It provides the livelihood of large segments of the population. This sector is mainly rain-fed, relying on relatively backward technologies. Hence, production and productivity remain extremely low (Degefe Befekadu & Berhanu Nega, 2000). Rain-fed agriculture is a common practice for many farming households (81.5%), with only 12.5% using both rain-fed and irrigated water to grow their crops (See Table 3).

Climate variability

Scholars worry about climate change. Different researchers have concluded that Ethiopian climate is changing. Still the rate of change differs within localities and it is difficult to conclude that the change is homogenous throughout the country. In this section the trends of climate variability

Table 3: *Distribution of agricultural and farming practices of sample household*

Variables		Freq.	%
Farming practice	Crop farming	109	54.5
	Mixed farming	80	40.0
	Others	8	4.0
Agricultural practice	Rain-fed	163	81.5
	Rain-fed and irrigated	25	12.5
	Others	6	3.0

Source: Survey result, 2013.

(temperature and rainfall) of the *woreda* are briefly analyzed based on historical meteorological data using line graphs. Moreover, farmers' perception to climate change and variability in their locality is presented in this section (Figures 2 and 3).

The two climate elements (temperature and rainfall) were considered for analysis because of their importance for agriculture as well as data availability. Monthly rainfall and temperature data from 1979 to 2010 for Nefas Mewucha meteorological station were obtained from National Meteorological Agency. However, rainfall data for some months of the year were missing. Hence, the missing values for the rainfall and temperature records at the station level were interpolated and replaced using SPSS software.

Trend analysis and evaluation of the changes in major climate variables were crucial. To establish a priori evidence for existence of climate variability in the study area, temperature and rainfall were taken. According to meteorological data, the trend line estimated for average annual maximum temperatures in the study area was y = 0.0745x + 25.923. The trend line had a positive slope indicating the maximum temperature increased by 2.31º C over the time period of 1979 to 2010 (Figure 2). The analysis of temperature data obtained from the National Meteorological Agency tends to support the perception of a majority of respondents regarding increasing temperature trend.

Similarly, the estimated trend line for average annual minimum temperature was y = 0.0277x + 9.3238 (Figure 2). The trend line has a positive slope indicating that over the last three decades the minimum temperature rose by 0.86º C. This finding is consistent with studies by Tadege (2007), who states that the average minimum and maximum temperatures has increased by

0.25º C and 0.1º C respectively over the past decades, whereas the rainfall is characterized by very high levels of variability over the past 50 years. The range and duration of temperature is crucial to growth and productivity in the agricultural sector. According to Intergovernmental Panel on Climate Change (2001) an increase in average temperature will adversely affect crops, where already heat is a limiting factor of production.

In terms of rainfall, analysis of data from National Meteorological Agency (2007) indicated that the average annual rainfall for the period 1979-2010 was 635.7 mm with standard deviation of 145.37 mm. The highest annual average precipitation (890.48 mm) was recorded in 1987, whereas the lowest (482.6 mm) was recorded in 2002. As stated in Figure 3, the trend line estimated for average annual rainfall in the study area was y = -8.4956x + 775.88 with a slope of -8.4956, the estimated trend line is negative and the average annual rainfall decreased by -263.36 mm through the period 1979-2010. The analysis showed that perceptions of farmers with respect to decreasing trends of rainfall was in line with empirical analysis of rainfall trends using the data obtained from the meteorological stations.

In Ethiopia changes in rainfall are likely to affect agricultural productivity, food and water security, livelihoods and economic growth. Crop yield is strongly correlated with rainfall variability. Thus, the amount and temporal distribution of rainfall is the most important factor in determining national crop production levels (Girma & Fekadu, 2010).

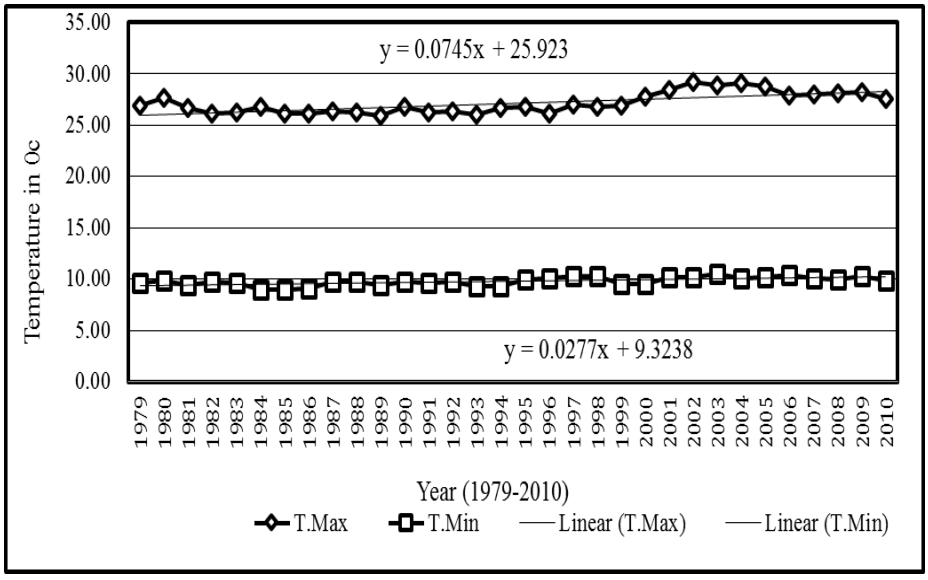

Figure 2: *Trends of annual average maximum and minimum temperature in the study area*
Source: National Meteorological Agency, 2011.

According to the Intergovernmental Panel on Climate Change (2001), there are no statistically significant trends in rainfall. However, more recent research results suggest that rainfall during the 'long-rains' decreased. Ethiopia's climate, in particular, is highly variable and there is a need to tackle existing climate risks effectively, as well as to plan for future changes. In addition to variations across the country, the climate is characterized by a history of climate extremes such as drought and flood as well as increasing trends in temperature and decreasing trends in precipitation (Ministry of Agriculture, 2000).

Crop production trend

Ethiopia's crop agriculture is complex. It often involves substantial variation in crops grown across the country's different regions and ecologies. It continues to be dominated by the country's numerous small farms that cultivate mainly cereals for both own-consumption and sales. Five major cereals (teff, wheat, maize, sorghum and barley) are the chief source of food. These account for about three-quarters of the total cultivated area (Central Statistical Agency, 2012).

In Lay Gayint *woreda*, crop production is characterized by rain-fed, traditional, small scale, subsistence orientated and labor intensive based on family labor. Different types of crops such as cereals, pulses and oilseeds as well as root crops like potatoes are cultivated in accordance with the

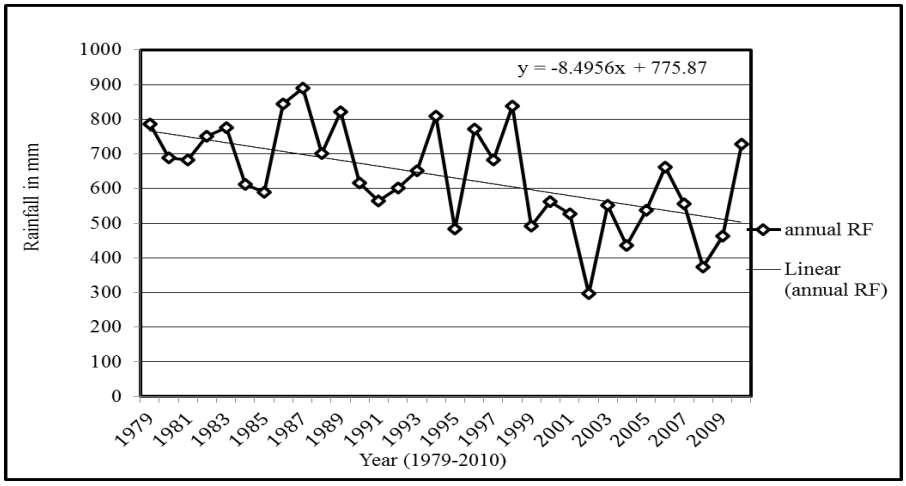

Figure 3: *Annual rainfall trend and variability of Lay Gayint* woreda
Source: National Meteorological Agency, 2011.

diversity of climatic and soil conditions. The *woreda*'s agricultural office has given high priority to the agricultural sector and has taken major steps to improve its efficiency. However, various problems are holding this back. One major cause of underproduction is climatic extremes such as drought and floods. Temperature and precipitation are two of the primary factors of the

quality and quantity of crop yield in a given year. Variations in either temperature or precipitation can significantly alter the outcome of crop productivity (Intergovernmental Panel on Climate Change, 2001). Often crop failure results in famine. Such climate-related disasters made the area remain dependent on food aid for the past two years. According to the agricultural office, at the present time even if productivity would grow, climate change would still have a dramatic impact.

As can be seen from Figure 4, there is high variability in crop production trend. The crop production declined in 2000/01, 2002/03, 2004/05 and 2009/10, which is mainly attributed to extreme weather events such as drought, late onset, erratic rain and early offset of the rain. Alebachew Adem and Woldeamlak Bewket (2011) noted that besides the very low levels of productivity, Ethiopian agriculture is characterized by wide fluctuations in total output from year to year. The year-to-year fluctuations are caused mainly by the inter-annual rainfall variability. The highest crop productions were recorded in 2010/11 and 2012/13. The report regarding crop production trend from Lay Gayint woreda Agricultural and Rural Development office was contrary to the view of farmer's perception on trends of crop production in the study area. That means gaps between official agricultural statistics and households' responses regarding crop yield were identified. The *kebele* agricultural experts, reported 40 – 70 quintals of crop yield per hectare in the fragile land of the study sites which is quite implausible and hence not useful to substantiate the findings on crop yield.

Experts working in the field have a tendency to inflate production figures because their work performance is mostly evaluated based on the reported figures. Triangulation was done by taking this report to older household heads. They absolutely rejected the experts' reports. Information provided by the households does justify that crop yields are gradually going down in their locality though it seems somewhat deflated for outside observers and general national observers. In addition, as they were born, grew up, and worked in the farming households, crop yield is going down particularly in the fragile landscapes of northern Ethiopia. Triangulation was also done through visiting the households when they harvested and threshed their crops in the field, which further justified the households' responses.

The above results do not mean that there is no growth in total production of the country. Indeed, growth in total agricultural production has been observed in some households living in modest environmental conditions, thanks to new technology packages, good land management practices and irrigation that increased crop productivity over time. However, some scholars also related the effectiveness of new technology packages (at least partially) in boosting crop production with good weather conditions (Alemayehu Seyoum Taffesse et al., 2011). They also argued that rather than technology adoption, the major factor behind the growth of total production in Ethiopia has been the expansion of cultivated land area. For example, grain production has registered a growth of 74%, with yield growing by only 18% and area cultivated by 51% between 1989/90 and 2003/04. From 1994 to 2002, 70%

of cereal production increases resulted from expansion of cultivated land area (Alemayehu Seyoum Taffesse et al., 2011) and it is in an increasing trend in recent years. However, cultivable lands are already exhausted in the study area, so that there is no possibility of expanding agricultural land by households. Hence, the results seem logical for the fragile landscapes of northern Ethiopia where rain-fed crops are more sensitive to climatic anomalies. Rainfall variability is important determinant contexts of livelihoods of the community in Ethiopia. A favourable climate is needed in order to keep a sustainable agricultural production that affords better livelihoods to the households.

For rural communities, crop production constitutes one of the major sources of livelihood. Farmers in the study area grow a diverse range of crops as it is shown in Table 4. The data obtained from household survey indicates that wheat, teff, barley, bean and pea are the major crops grown by the majority of the respondents. However, the proportion of farmers that are growing haricot bean and sunflower are few in number.

In the study area, drought, pests and disease, and soil erosion are recurring problems affecting agricultural activities and human wellbeing. Significantly, farmers pointed out that the yield of their fields is declining from year to year.

Drought has been a recurring phenomenon in Ethiopia for millennia, being recorded at least as early as 253 B.C. Modern rainfall records for Ethiopia

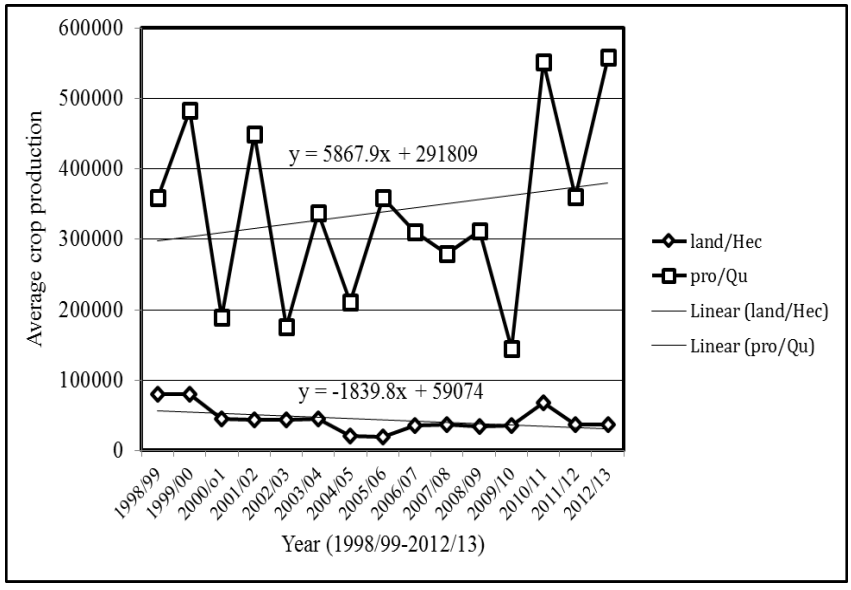

Figure 4: *Crop production trend in Lay Gayint* woreda
Source: Lay Gayint woreda Agricultural and Rural Development office, 2012.

Table 4: *Average yield of major crops and land allocation for the 2011/2012* meher *season*

Major crops	Area coverage in ha	Average productivity yield/ha
Wheat	58.97	10.67
Teff	30.42	15.83
Barley	26.88	8.39
Pea	24.99	13.33
Beans	15.38	13.51
Lentil	11.94	18.80
Sorghum	8.00	8.70
Chickpea	2.75	13.00
Haricot bean	2.00	11.15
Sunflower	1.38	14.05

Source: Survey result, 2013.

have demonstrated large differences from year to year as well as great local variability (Fasil G. Kiros, 1993). The effects of drought in Ethiopia in the last two decades have been drastic (10-100% yield loss). Prolonged drought

Table 5: *Productivities of major crops under non drought conditions (Yn) and drought conditions (Yd) and corresponding DSI in 2011/12 growing year*

Major crops	Productivity/ha in non-drought condition (Yn)	Productivity/ha in drought condition (Yd)	Drought susceptibility Index (DSI)
Wheat	5.03	1.87	0.96
Teff	2.76	1.07	0.94
Barley	5.65	1.81	1.04
Pea	3.05	0.90	1.08
Beans	3.19	1.02	0.90
Lentil	2.64	1.10	0.90
Sorghum	5.70	2.56	0.85
Chickpea	3.80	1.40	0.97
Haricot bean	1.39	0.56	0.91
Sunflower	1.88	0.94	0.77
Mean yield	3.51	1.33	

Source: Survey result, 2013.

has lowered production of major food crops, resulting in an acute and recurrent shortage of food. The farmer's ability to adjust to drought depends upon available technology and the production system in use (Habtamu Gessesse, 1999).

A dimensionless slope termed drought susceptibility index (DSI) was suggested by Fischer and Maurer (1978) as a useful way of comparing crop yield performances between drought levels and non-drought condition and a measure of yield stability. It expresses the separate effects of yield potential and drought susceptibility on yields under drought. In these terms, lower drought susceptibility is considered synonymous with higher drought resistance.

Drought susceptibility index values ranged from 0.77 to 1.08 (Table 5). The result indicates that barley and pea are relatively drought susceptible (DSI >1.0), while wheat, teff, beans, lentils, sorghum, chickpea, haricot bean and sunflower were relatively drought resistant (DSI <1.0). Crops with DSI values <1.0 can be considered to be drought resistant, because they exhibited smaller yield reductions under drought condition compared with non-drought condition. This result is in accordance with Alebachew Adem and Woldeamlak Bewket (2011), who state that drought is the major physical challenge to agriculture in the Amhara National Regional State and the effect of rainfall variability on crop production varies with the crops cultivated, types and properties of soils and climatic conditions of a given area.

CONCLUSIONS

Like in most rural areas of Ethiopia the source of income for most of the people in Lay Gayint woreda is agriculture, mainly crop production. It is characterized by rain-fed, traditional, small scale, subsistence orientated and labour intensive based on family labor. Due to the diversity of climatic and soil conditions, different types of crops are grown, of which cereals, pulses, oil seed and root crops like potatoes are the major ones. Drought is the major constraint, which reduces the productivity of crop. However, there is a greater variability for yield performance of different crops under drought situation. Drought susceptibility index values ranged from 0.77 to 1.08 (Table 5). The result indicates that barley and pea are relatively drought susceptible (DSI > 1.0), while wheat, teff, beans, lentils, sorghum, chickpea, haricot bean and sunflower were relatively drought resistant (DSI < 1.0). The study findings also indicated that all studied parameters have an important role in drought tolerance and could be used effectively for selecting drought-tolerant varieties particularly at reproductive stage.

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ORIGINAL ARTICLE

COMMUNITY BASED ECOTOURISM AS A TOOL FOR BIODIVERSITY CONSERVATION IN WUNANIA-KOSOYE NATURAL ATTRACTION SITE, ETHIOPIA

Endalkachew Teshome[1], Ascahalew Worku[2] and Mulugeta Astery[3]

ABSTRACT

Tourism can play a vital role in protecting the environment, conserving biodiversity and maintaining sustainable development. Furthermore, tourism has the power to enhance the environment, to provide fund for conservation, to preserve culture and history, to set sustainable use limits, to protect wildlife and to add value to biodiversity. In this paper, a cross sectional study in Wunania, Kosoye, was used to describe the existing situations and events in the area. For the study, both quantitative and qualitative methods were employed. The study established that the local community's awareness level of biodiversity conservation and the economic significance of ecotourism in Wunania-Kosoye natural attraction site was very high. Yet, this contrasted with a loss of biodiversity in the last decades due to deforestation, uncontrolled grazing, and land degradation. The research finding suggested that Community Based Ecotourism is becoming preferable when it is compared with other alternative approaches for conserving biodiversity in Wunania-Kosoye natural attraction site.

Keywords: community based ecotourism, Wunania-Kosoye, tourism, development

INTRODUCTION

Tourism can play a vital role in protecting the environment, conserving biodiversity and maintaining sustainable development (UNEP & WTO, 2005). Moreover, it has the power to enhance the environment, to provide fund for conservation, to preserve culture and history, to set sustainable use limits and to protect wildlife and add value to biodiversity (Mcintosh, Goeldner & Richie, 1995). Ecotourism to biodiversity hotspots are estimated to be growing at 100% a year and is considered as one of the most rapidly expanding sectors of the travel industry (Environmental Grantmakers Association, 2008), and it is part of a growing niche market of the tourism industry. Its contribution to the world economy has grown fast in recent years (United Nations, 2001). community based tourism (CBT) emerged in the mid-1990s as a generally small-scale initiative involving interactions between visitor and host community particularly suited to rural and regional areas. CBT is commonly understood to be managed and owned by the community, for the

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community, and is committed to making a low impact on the environment and local culture, while helping to generate future employment for local people (Timothy, 2002).

Community based ecotourism (CBET) serves as a means to conserve both cultural & natural resources of the particular tourist attraction through diversifying economic activities (Godfrey & Clarke, 2000). It contributes to poverty reduction (Conservation International, 2003), to finance infrastructure, and social amenities improvement (Denman, 2001). Moreover, it is a source of employment opportunities for local communities (Aref, 2010; Tisdell, 2003) and a means for creating educational opportunities (Bushell & Eagles, 2007), while helping tourism to be viewed as a tool for community development (Allen, Long & Perdue, 1993). CBET is managed and owned by the community with the purpose of enabling visitors to increase their awareness and to learn about the community as well as the local people's ways of life (Coward, 2001; Potjana, 2003).

Studies show that local community level of awareness, knowledge, perception, participation and attitude are vital factors for successful CBET in a particular destination (Ap & John, 1998; Teye, Sanmoz & Sirakaya, 2002; Tosun, 2006; Wood, 2002). Increasing awareness of tourism interaction with the environment should lead tourist destinations and tourism businesses to behave environmentally responsibly (Richard & Hall 2000). As CBET is exercised in a given area, local community members can organize themselves and engage in the production and delivery of tourism services such as cultural show, community lodge, local tour guiding, and producing and selling of handicrafts (Strasdas & Zeppenfeld, 2008). However, the degree of engagement of local people in such type of activities depends on their level of awareness (Fenta & Mekonnen, 2009). According to Teye, Sanmoz and Sirakaya (2002), miscommunication and wrong perceptions of local community can be the major barriers to regional tourism development projects. They argue that local community support is crucial for the successful completion of CBET projects.

Although Wunania-Kosoye natural attraction has a huge potential for the development and implementation of ecotourism, its contributions to the tourism sector is low. As a result, the major sources of community livelihood are subjected to only subsistence agriculture with traditional farming practices (Negash et al., 2010). Studies show that even though only 20% of the Wunania-Kosoye area is suitable for cultivation, more than 47% of the total area has been cultivated (North Gondar Zone Culture Tourism Department & Amhara National Regional State-CTPDB, 2010). So about 27 % of the cultivated lands are either steep slope or degraded lands. To improve the livelihood of the community and protect the natural attraction site from further degradation a preferable economic activity of the area would be CBET.Introducing and developing CBET in a natural attraction site like Wunania–Kosoye has such important advantages as maintaining biodiversity and promoting sustainable development; ecotourism is a travel that concerns itself with the flora, fauna, geology, and the ecosystems of an area as well as

the people who live in and nearby the natural attraction (Fennel, 2002).

OBJECTIVES AND METHODS

The objective of this research was to describe the awareness and perception of the local community in Wunania-Kosoye of CBET and biodiversity conservation. Wunania-Kosoye is situated at 12°45'02.8" N latitude and 37° 32'26.4" E longitude in the northwestern highland with altitudes ranging from 1500m to 3200m above sea level. It extends from Chirambezo *kebele* in Lay Armachiho to Kosoye Ambaras *kebele* in Wegera *woreda*. It is found along the historical tourist route from Gondar to the Simen Mountains National Park.

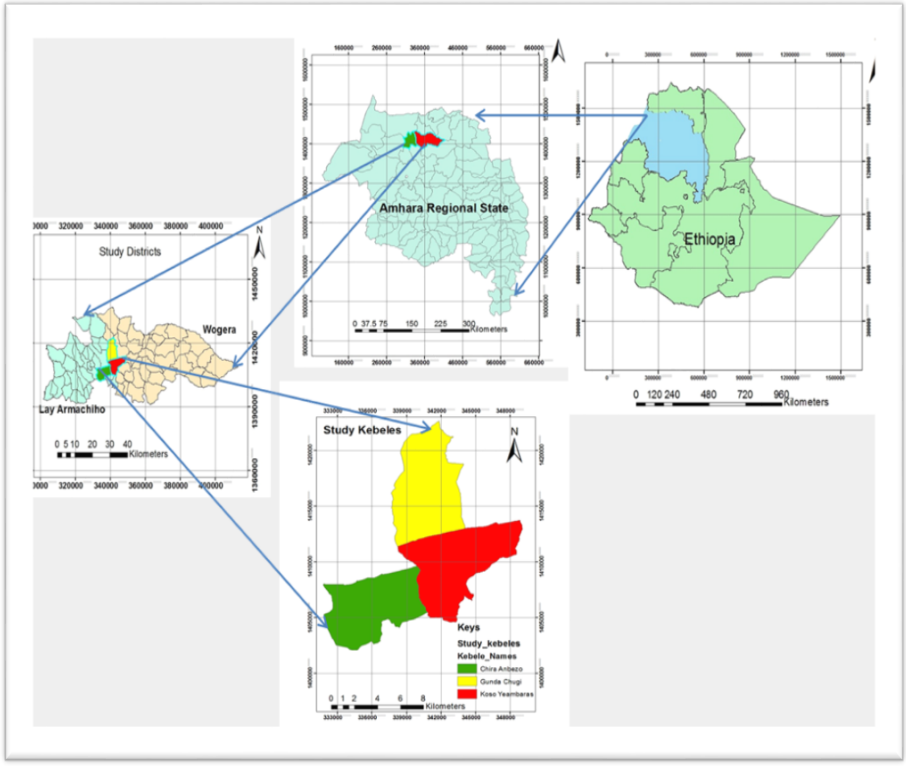

Figure 1: *Location of Wunania-Kosoye natural attraction/ wildlife Reserve*

National Park.

A cross-sectional analysis was made to describe the existing situations and events. Both quantitative and qualitative methods were employed. When research is conducted in natural settings, supplementing the quantitative with qualitative methods helps to investigate, interpret, and measure real

life events and complex socio-cultural aspects of the livelihoods and impacts of development from the local communities' perceptions (Knerr, 2008).

The target population of the study is the local community residing in Chirambezo, Kosoye Ambaras and Gunda Chugie *kebele*s of Wunania-Kosoye natural attraction site. Moreover, experts/professionals from the District's Culture and Tourism Office, District Environmental Protection Land Administration Authority Office, North Gondar Zone Culture Tourism Department, Sustainable Natural Resources Management Program and local guides were taken as key informants.

Both probability and non-probability sampling methods and the stratified, simple random and purposive samplings were used. These techniques were considered appropriate for the complex situations of Wunania-Kosoye natural attraction site.

In order to select respondents to fill the questionnaire, stratified and simple random sampling techniques were used. There are three *kebele*s in the study area (Chirambezo in Lay Armachiho *woreda* and Kosoye Ambaras and Gunda Chugie both in Wegera *woreda*). Each *kebele* is dominated by one of the three agro-climatic zones. To get a balanced representation of the population from each agro-climatic zone, all *kebele*s were taken as the focus of this study. The target population of the study area is 4,369 households' heads (Kosoye Ambaras 1695, Chirambezo 1567 and Gunda Chugie 1107; Lay Armachiho and Wegera rural land owners' registration books, 2012). The sample size for quantitative data is determined by using Cochran's formula as indicated in Bartlett Kotrlik and Higgins (2001).

The study used the following formula to calculate sample size:

$n = N/ 1+N (e)^2$

The following step was used to determine sample size derived from the above formula to collect qualitative data using questionnaire, where:

n: designates the sample size the research used;
N: designates total number of households in all sample kebeles assuming that the issue affects all households;
e: designates maximum variability or margin of error (5%) (.05);
1: designates the probability of the event occurring.

Therefore,

$n = N/ 1+N (e)^2$
$n =4369/ 1 + 4369 (.05)^2$
$n =4369/ 1 + 4369 (.0025)$
$n =4369/ 1 + 10.9225$
$n = 4369/ 11.9225$
8 $n = 366$

Since the source population was less than 10,000, the correction formula
n = no/ 1+ no / N
was employed. Where:
no: initial sample
N: source population
n: required corrected sample.

Therefore n = 366/1+366/4369 = 338. The required sample size chosen to fill the questionnaire was 338 household heads residing in all *kebele*s. However, some factors, like rugged terrain, inaccessibility, and scattered settlements obliged us to select only 200 samples. Hence 71, 78 and 51 respondents were proportionally selected to fill the questionnaire from Chirambezo, Kosoye Ambaras and Gunda Chugie, respectively. Of the total sample, 154 were men and 46 women.

Sampling techniques and data analysis
For the qualitative method, non-probability sampling was chosen since it is useful to identify the relevance of the focus of the study rather than the representativeness of the population (Knerr, 2008). Purposive sampling technique worked well in selecting knowledgeable experts/professionals, stakeholders and local community leaders and elders as key informants. Moreover, key informant-interview was conducted with the selection of six community representatives/community leaders and elders. These representatives of the local community are residents of the villages and the first group of the key informants was interviewed to evaluate the perception, level of local community participation, and knowledge of CBET. Based on the population size, the resources available to cover the three *kebele*s and the time it took to interview one village dictated the use of a sample of two community representatives from each *kebele*.

All the three groups of key informants were selected purposely with respect to their roles in the land administration process, resource management activities, conservation works, ecotourism development activities and their knowledge and experience on the subject of the study. The selection of sample size for the interview stressed the quality of the respondents and their potential know-how to answer the questions and to provide rich and relevant information for the analysis and interpretation of the data.

The qualitative data were analyzed based on the procedures by Bith (2011). The interviews were transcribed (for audio recorded conversations) and summarized (for non-recorded conversations) into word processing files for analysis. Key contents and concepts were searched for within each file and in the secondary data documents. These contents and concepts were then categorized into three main themes i.e.,

- local community level of awareness: about the relation of biodiversity conservation and community based ecotourism;
- community participation: association between community awareness on biodiversity and their level of participation in community-based ecotourism development;

- economic effects of Wunania Kossoye CBET: the economic benefits compared to the alternative income.

The quantitative information was analyzed first using descriptive methods and then inferential techniques of data analysis. In the data analysis process, the completed questionnaire was coded and the data was analyzed by using the Statistical Package for the Social Sciences (SPSS) Version 16.0. Data was interpreted to show a detailed picture of the existing situation in the study area. In descriptive analysis, the frequency distribution, percentage, and average mean were used. From inferential statistics, Chi-square test was run to see the association between the awareness of the community on biodiversities and their knowledge on the significance of community participation. An independent t-test was used to compare the awareness level between male and female respondents, and a one way ANOVA was used to see the difference in awareness level among respondents of the three *kebele*s and to analyze the difference in the concentration of natural attraction resources among the three *kebele*s.

RESULTS AND DISCUSSION

The local community awareness level on biodiversity conservation and the economic significance of ecotourism in Wunania-Kosoye natural attraction site was evaluated. The result, as can be seen from Table 1, showed that 91.4% of the respondents were well aware about the relation of biodiversity conservation and CBET. Very few respondents (3.8%) did not know the value of biodiversities in their *kebele*. Table 1 also indicated that the majority of the respondents (78.5%) had adequate knowledge about biodiversity conservation in their *kebele*, and 11.8% of them were unable to respond. Only 9.7% of the respondents had no adequate knowledge about biodiversity conservation in their *kebele*. Based on these findings, it is possible to understand that lack of awareness is not the main problem of biodiversity conservation in this site. Furthermore, the cumulative average agreement level of the respondents to apply the biodiversity conservation awareness given them by Government officials and professionals was about 4.12 mean average, verifying their agreement.

The data collected on the interdependency between biodiversity and ecotourism showed that 76.9% of the respondents recognized the great dependency of ecotourism on the biodiversities of the area. Some respondents (15.6%) were not sure whether ecotourism was dependent on the biodiversities of the site or not, and only 7.5% could not recognize its relation with biodiversities.

The triangulated qualitative information/data obtained from the interviews with key informants and field observation on the problems of biodiversity conservation in Wunania-Kosoye area also revealed that low level of community awareness was the major problem for the last five years. However, after the introduction of CBET into the site, the problem was restricted to certain individuals who were directly benefited from the uncontrolled use of natural resources. Besides, these key informants observed the loss of biodiversity in the last decades due to deforestation of natural vegetation for

cultivation, constructions, furniture, fuel-wood, and charcoal in addition to uncontrolled grazing, seasonal migration of cattle, and land-sliding especially around Zagol Amba and Wunania areas. According to the key informants,

Table 1: *Local community awareness about biodiversity conservation and significance of CBET at Wunania-Kosoye, North Gondar*

Level of awareness on biodiversity conservation and CBET	Relative Agreement										Mean Average
	SDA		DA		N		A		SA		
	F	%	F	%	F	%	F	%	F	%	
Biodiversities	3	1.6	4	2.2	9	4.8	99	53.2	71	38.2	4.24
Biodiversity conservation	4	2.2	14	7.5	22	11.8	91	48.9	55	29.6	3.96
Implementation of biodiversity conservation based on professionals advices	3	1.6	7	3.8	12	6.5	107	57.5	57	30.6	4.12
Ecotourism depend on biodiversities.	9	4.8	5	2.7	29	15.6	97	52.2	46	24.7	3.89
Economic benefits of ecotourism	1	5	5	2.7	4	2.2	94	50.5	82	44.1	4.35
CBET promotes conservation of natural resources	4	2.2	2	1.1	8	4.3	95	1.1	77	41.4	4.28
CBET has more sustainable economic benefit than other livelihood alternative	1	.5	5	2.7	11	5.9	110	59.1	59	31.7	4.19
Importance of local community participation	5	2.7	1	.5	0	.0	88	47.3	92	49.5	4.40
Total (local community awareness about biodiversity conservation and significance of CBET)											4.801

Note: The Likert scale was used where, SDA=Strongly Disagree, DA=Disagree, N= Neutral, A=Agree, SA= Strongly Agree.

Source: Primary data of field survey 2012.

migration of wildlife due to deforestation, wildfire, and eucalyptus tree plantation were the other challenges in the study area.

Information obtained from the key informants on measures taken so far to solve biodiversity conservation problems reflected that different physical and biological conservation work was done in some selected watershed areas, but the measures taken were not sufficient to mitigate the problems. According to these informants a variety of methods were used to protect the biodiversity of the study area. The most frequently mentioned methods were promoting integrated watershed management, introducing ecotourism and CBET as alternative livelihood activities to reduce dependence on agriculture only, developing bylaws to protect wildlife from illegal hunters, planting fast growing indigenous plants, properly implementing rural land use guidelines, restricting seasonal migration of cattle, encouraging zero grazing, strengthening physical conservation works with biological conservations, and preserving highly fragile areas by prohibiting cultivation.

During the interview conducted with the local community leaders, elders, local guides, and experts/professionals on local community participation in biodiversity conservation it was found out that local community participation in biodiversity conservation would be active since an alternative source of income would be created in the study area

Community awareness on the benefits of CBET

According to Table 1, a significantly high number of respondents (94.6 %)

Table 2: *Association between community awareness on biodiversity and participation in its conservation*

Statistical model			Asymp. Sig.(2-sided)	Monte Carlo Sig. (2-sided)		Monte Carlo Sig. (1-sided)	
				95% Confidence Interval		95% Confidence Interval	
	Value	df		Sig.	Lower Bound	Upper Bound	Lower Bound	Upper Bound
Pearson Chi-Square	18.278	12	.107	.140	.133	.147		
Likelihood Ratio	19.259	12	.082	.028	.025	.031		
Fisher's Exact Test	25.089			.016	.014	.019		
Linear-by-Linear Association	.700	1	.403	.429	.419	.438	.207	.224
N of Valid Cases	186							

Source: Primary data of field survey 2012.

believed that ecotourism could provide economic benefits to the local community. Few respondents (7.7%) failed to believe in the economic benefits of ecotourism, while the rest (2.2%) could not tell whether it had benefits or not.

Out of the total respondents, 92.5% believed that CBET could have a huge contribution to promoting the conservation of natural resources in Wunania-Kosoye area, and only 3.3% disagreed with the significance of CBET for conservation. The remaining 4.3% of the respondents were unable to decide whether CBET was significant for biodiversity conservation or not.

Table 1 also revealed that 90.8% of the survey respondents preferred CBET to other means of livelihood alternatives to maintain sustainable economic benefit, 5.9% of the respondents were neutral, and only 3.2% refused to prefer CBET to other means of livelihood alternatives. The cumulative mean average agreement level of the local community participation was 4.40, showing that the local community was well aware about the significance of local community participation in any affairs of their *kebele* ecotourism development. The result of the key informant interview demonstrated that there was a higher rate of significance level for CBET than other alternative methods of biodiversity conservation. Moreover, key informants suggested that environmentally conscious eco-tourists were interested in visiting areas

with rich biodiversity and natural beauty. Unlike other economic activities, the economic benefit obtained from CBET depends on the degree to which conservation of biodiversity is undertaken and on the extent to which natural beauty is maintained. Furthermore, this economic sector is not over consuming or depleting the natural resources of the area. Therefore, CBET can be taken as a more preferable livelihood alternative than other economic activities to maintain biodiversity and for a sustainable development of the site.

There is no significant difference (Pearson Chi-Square =.140 = p > .05) between awareness on biodiversity and knowledge about the importance of community participation. This means that there is an association between the awareness of the respondents about the biodiversities of the kebele and the respondents' knowledge about the significance of community participation. It implies that effective implementation of biodiversity conservation in the site can be achieved through increasing community participation in natural resources conservation activities.

Table 3: *Differences in level of awareness about biodiversity conservation and significance of CBET between male and female respondents*

Group Statistics				
Sex	N	Mean	Std. Deviation	Std. Error Mean
male	140	4.1893	.45738	.03866
female	46	4.1522	.56575	.08342

Source: Primary data of field survey 2012.

Table 3 reveals that the mean value of male respondents in terms of awareness about biodiversity conservation and significance of CBET is 4.19, which is slightly greater than the mean value of females (4.15). The reason for

Table 4: *Differences in level of awareness about biodiversity conservation and significance of CBET between male and female respondents*

Independent Samples Test		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% CI Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean	Std. Error	Lower	Upper
	Equal variances assumed	5.473	.020	.449	184	.654	.0371	.0826	-.1259	.2001
	Equal variances not assumed			.404	65.42	.688	.0371	.0919	-.1465	.2207

Source: Primary data of field survey 2012.

this slight difference in mean (0.04) is that male respondents have more exposure to participation in different community awareness raising programs

Table 5*: Difference in awareness level among respondents of the three* kebeles

Level of awareness on biodiversity conservation and CBET	N	Mean	Std. Deviation	F	Sig.
Chirambezo	66	4.3977	.36553	14.641	.000
Kosoye Ambaras	69	4.1449	.47725		
Gunda Chugie	51	3.9461	.51675		
Total	186	4.1801	.48507		

Source: Primary data of field survey 2012.

than female respondents. However, the t-test in Table 4, shows that there is no significant difference (t-test = .688 = p > .05) between male and female participants in terms of awareness about biodiversity conservation and importance of CBET.

Table 6: *Multiple comparisons of differences in awareness level among respondents of the three* kebele*s*

Level of local community's awareness on biodiversity and its conservation LSD

(I) Residence of Respondent	(J) Residence of Respondent	Mean difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Chirambezo	Kosoye Ambaras	.25280	.07797	.001	.0990	.4066
	Gunda Chugie	.45165	.08442	.000	.2851	.6182
Kosoye Ambaras	Gunda Chugie	.19885	.08362	.018	.0339	.3638

Source: Primary data of field survey 2012.

Finally, one way ANOVA was used to see whether there is a significant mean difference in awareness level among respondents of the three *kebele*s or not.

Table 5 reveals that the highest mean value of agreement level of respondents' awareness on biodiversity conservation and significance of CBET is observed in Chirambezo (4.3977), followed by Kosoye Ambaras (4.1449), while the least is Gunda Chugie (3.9461). This may be due to the fact that Gunda Chugie is found in a remoter area in comparison to the other two *kebele*s.

There is a statistically significant difference among the respondents of the three *kebele*s (f value for Chirambezo and Kosoye Ambaras (.001), for Chirambezo and Gunda Chugie (.000) and for Kosoye Ambaras and Gunda Chugie (.018)) = P < .05. This is because of the fact that the local communities living in Chirambezo and Kosoye Ambaras *kebele*s have got opportunities to participate in different community awareness raising

programs. Chirambezo community especially started to engage in CBET activities, while the community of Gunda Chugie is the least favored, due to the inaccessibility of the *kebele.*

CONCLUSION

Local communities' awareness level on biodiversity conservation and the economic significance of ecotourism in Wunania-Kosoye Natural Attraction Site was relatively high, while there was loss of biodiversity in the last decades due to deforestation, uncontrolled grazing, and land degradation. A range of methods have been used to protect the biodiversity of the study area. The most frequently mentioned methods are promoting integrated watershed management, introducing ecotourism in the area, and CBET as an alternative livelihood activity, developing bylaws to protect wildlife from illegal hunters, and the plantation of fast growing indigenous plants, properly implementing rural land use guidelines, and strengthening physical conservation work. On the level of awareness about biodiversity conservation and CBET, there is a statistically significant difference among respondents of the three *kebele*s (f value for Chirambezo and Kosoye Ambaras (.001), for Chirambezo and Gunda Chugie (.000) and for Kosoye Ambaras and Gunda Chugie (.018)) = $P < 0.05$). Research findings suggest that CBET is becoming preferable to other alternative approaches for conserving biodiversity in Wunania-Kosoye Natural Attraction Site.

As a conclusion to the study the following recommendations are offered:

- To assure the effective biodiversity conservation at the Wunania-Kosoye Natural Attraction Site, active community participation in natural resources conservation activities be implemented.
- To enhance community awareness on the value of CBET development to biodiversity conservation, awareness creation programs must be conducted in all *kebele*s in the Wunania-Kosoye at Nural Attraction Site.
- In order to conserve biodiversity at the Wunania-Kosoye Natural Attraction Site, Amhara Regional State Culture and Tourism Bureau has to give special attention to CBET development.

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ORIGINAL ARTICLE

LAND USE AND LAND COVER DYNAMICS: DRIVING FORCES AND IMPACTS IN LAY GAYINT WOREDA OF AMHARA NATIONAL REGIONAL STATE, ETHIOPIA

Girma Zewdie[1] and Ebrahim Esa[2]

ABSTRACT

The objective of this study is to assess the pattern and to identify the major driving forces of land use and land cover change as well as to analyze the consequences of these changes in Lay Gayint woreda. *The study used Landsat images of 1984 and 2004 to produce two layers of maps using Remote Sensing and GIS. The results showed that cultivation land and settlement increased by 51.8 % followed by increment in bare land by 19.1 % while communal grazing, forest cover, and shrub have reduced by 52.6 %; 79.6 % and 28.4 % respectively. Population growth, less hand holding related to traditional farming practices, and high fuel energy demand were the major driving forces for the observed changes. One of the major negative impacts of land use and land cover change in the* woreda *is land degradation, mainly in the form of erosion and the resulting loss of fertility. To curb this problem, the study recommends practising sustainable land management utilizing alternative energy sources, implementing expansive family planning, and creating awareness on the impacts of those changes.*

Keywords: GIS, remote sensing, land use and land cover changes, land degradation, soil fertility, soil erosion, sustainable land management practices.

INTRODUCTION

The question of what factors drive land use and land cover change has remained largely unanswered. Recently, human activities and social factors were recognized to have a paramount importance in land use and land cover change (Lambin, Geist & Lepers, 2003). The conceptual understanding of the proximate causes and underlying forces has a crucial importance in identifying the causes of land use and land cover changes (Meyer & Turner, 1994). Proximate (direct) causes are immediate actions of local people in order to fulfill their needs from the use of the land. These causes include agricultural expansion, wood extraction, infrastructure expansion and others that change the physical state of land cover. At the proximate level, land use and land cover change may be explained by multiple factors rather than by a single variable (Lambin, Geist & Lepers, 2003). Underlying (indirect or root) driving forces are fundamental processes that push proximate causes into immediate action on land use and land cover. Underlying driving forces such

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as demographic pressure, economic status, and technological and institutional factors, influence land use and land cover in combination rather than as single causations (Meyer & Turner, 1994).

Land use and land cover change play an important role in global environmental change. They are major factors affecting sustainable development. The scientific community has now come to recognize the diverse roles of land use and land cover change. Consequently, the need for understanding of land use and land cover change has been increasingly recognized in global environmental research (Lambin, Geist & Lepers, 2003). The degree and rate of change in land-cover and some land-uses are known to some extent. According to Turner et al. (1993), most of the earth's surface is already modified, except those areas that are peripheral in location or are fairly inaccessible. Of the total land surface, about 40% has been changed in the form of conversion into other uses. It is only about 25% of the land that remains nearly unchanged. In the case of Ethiopia, studies on land use and land cover change are few (Solomon, 1994). Those limited studies focused on the Northern Ethiopian highlands, areas early settled and relatively overpopulated (Belay Tegene, 2002).

One of the greatest historical challenges to the Ethiopian economy is linked with the problems of rural environment in general and that of the rural highlands in particular. Rural highland areas support about 88% of the human population, 95% of the cropland, more than 75% of the livestock and 90% of economic activities in the country (Mc Cann, 1995). This role as an economic powerhouse is related to the sufficient rainfall, moderate temperature and well-developed soil, which are characteristics to these highlands. Moreover, highlands in Ethiopia were historically the basis for the early development of agriculture and have been prior targets of settlement for the human population (Hürni, 1990).

More recently agriculture in the Ethiopian highlands has extended to more difficult terrains and to traditionally unexploited parts of the environment. The expansion of agricultural practices into terrains such as steeper slopes and swampy plains in many parts of the northwestern highlands of Ethiopia may indicate the presence of pressure on land, vegetation, and water resources. These parts of the country are amongst the most degraded and those with high rate of nutrient depletion in sub-Saharan Africa. As stated in the Ethiopian Forestry Action Program (1994), cited in Muluneh (2003), depletion of soils and plant biodiversity are recognized to be the two most important forms of environmental degradation in rural Ethiopia.

Historically, population was regarded as the most important and the only driving force behind global change. However, currently it is understood that environmental change has many driving forces that are closely interrelated, population being only one among them (Rindfuss & Adamo, 2004). In most developing countries, population growth has been a dominant cause of land use and land cover change (Kahsay Berhe, 2004). As a result, there is a significant statistical correlation between population growth and land cover

conversion in most African, Asian, and Latin American countries (Sege, 1994). Similarly, in Ethiopia, population pressure has been found to have negative effect on shrub land, communal grazing land and forests (Woldeamlak Bewket, 1993).

In the case of Ethiopia, views with regard to the relationship between population growth and land degradation are variable. For instance, the highland parts of the country have been severely degraded due to population growth coupled with early settlement, topographical features and geological history. Contrary to this, case studies in Sebat-bet Guraghe have highlighted a more positive impact of a high density of population. Similarly, in Konso, where population is relatively high and located at the margin land, degradation is less severe due to indigenous knowledge for soil conservation (Kahsay Berhe, 2004).

According to Turner et al. (1995), land use change is a common phenomenon associated with population growth, market development, institutional factors and policy action. The entire ecological infrastructure such as vegetation cover, soil characteristics, plant and animal population, and hydrological cycle has been strongly influenced by the conversion of land and forest resources. Understanding of the institutional causes (i.e. political, legal, economic, and traditional) and their interaction with individual decision making is important in explaining land use changes. Institutional causes need to be considered at micro and macro levels because the implementation of macro policies is practiced at the micro level. Land use and land cover changes are influenced significantly when macro policies undermine local policies in that the structure of local and national polices may determine local people's access to land, capital, technology and information (Lambin, Geist & Lepers, 2003).

The absence of applicable forest policy is cited as a contributing factor for deforestation in different parts of the world including Ethiopia. According to FAO (1999) the country's forest cover in 1989 was 12.9 percent. A decade later, in 1997, the forest cover was estimated to be only 4.2 percent (FAO, 2001). In addition, the lack of appropriate land use and forest policies as well as the absence of corresponding laws are responsible for the decline of forests in southwestern Ethiopia. The promotion of industrial crops with high return has encouraged the direct clearance of forests. The policy of food self-sufficiency based on surplus crop production has also been realized at the expense of forest degradation in southwestern Ethiopia (Million, 2002). Likewise, rapid expansion of crop cultivation at the expense of forests occurred due to the land reform policy changes of 1975 (Amare, 1994). Another obvious consequence of land use and land cover change, particularly of deforestation, is the shortage of fuel-wood to meet household energy consumption posed by high population pressure (Girma et al., 2002). As a result, land use change and resource degradation have been affected by land tenure system and government policies in Ethiopia.

Land use and land cover change can impact the socio-economic status of the rural population. Agricultural productivity, which may determine rural income, wealth and education, can be affected by the consequences of land use and land cover changes. Therefore, understanding of the complex interaction of these changes in their temporal and spatial patterns and processes is the baseline to formulate focused and targeted policy interventions in rural development and environmental management (Lambin, Geist & Lepers, 2003).

Land cover transformation in both tropical and temperate regions, by provoking intensified deforestation, has important implications in the dramatic loss of plant species in terms of density, diversity and community composition. Ethiopia, with the fifth largest flora in tropical Africa and with about 12% of its plant population being endemic, has been critically affected by the loss of plant biodiversity (Tewolde Berhan, 1991). Despite housing a large diversity of biological resources, biodiversity in Ethiopia is largely being affected by human activities (Kahsay Berhe, 2004). Assessments of this impact have indicated that forests have become depleted at a large scale as a result of expansion of agriculture and settlement areas. For instance, Ethiopia has about 60 million hectares of land for grazing. This figure has been reduced to less than 55 million hectares due to grassland conversion into other land uses and covers (Kebrom & Hedlund, 2000). On the other hand, an expansion of cultivated land at the expense of bush lands, natural pasture and forest, caused by increasing human population, has strongly affected the number of livestock and the quality of their products. This in turn induces overgrazing and soil erosion in different parts of the country. These local-level changes play a pivotal role in affecting the health of the ecosystem. Loss of biodiversity, soil degradation, and environmental deterioration are largely results of land use/cover change. An example of the negative effects of land use/cover change is that land productivity declines under continuous cultivation, overgrazing and soil erosion (Muluneh, 2003).

In Ethiopia, only a few land use and land cover change studies have been conducted in different parts of the country. As a result, land use and land cover change, and its driving forces and impacts are hardly documented. This study aims to contribute to the knowledge on land use and land cover change, its driving forces and consequences with an empirical study in Lay Gayint *woreda*. The target *woreda* is taken as a representative area for the northwestern part of the country in terms of topography, climate, vegetation and socioeconomic conditions. The pattern of land use and land cover is one of the indicators of sustainability of resource utilization and management, which provides a basis for conservation planning. Hence, this study is significant to understand the rate of land-cover and land-use change, to identify the causes and impacts of these changes and, finally, to find solutions for sustainable use of land and other resources. The study analyzes the rate of land use and land cover change over the past 20 years, identifying the major driving forces and impacts in these processes.

STUDY AREA

Lay Gayint is one of the ten *woreda*s of South Gondar zone in Amhara regional state. It is bordered by the districts of Ebnat on the north, Tach Gaint and Simada on the south, Misrak Estie on the southwest, Farta on the west, and Meket on the east (North Wollo zone). The absolute location of the *woreda* is 11°32'-12° 16' N Latitude and 38° 12'- 38° 20'E Longitude. The administrative center is Nefas Mewcha, located on the Woreta-Woldia highway, which is 237 km (North Gondar Trade and Transportation Department, 2011) away from Gondar city and 175 km away from the regional capital Bahir Dar. Other towns in the same *woreda* include Gob Gob, Sali and Checheho. The administrative town is located at 11°44'N Latitude and 38° 28'E Longitude.

The physiographic of the *woreda* is very rugged and dissected. The elevation ranges approximately from 1200 m above the sea level in the Tekeze lowland to 4235 m above the sea level on the Guna Mountain. The topography of the district is characterized by 11.97 % plain, 5% mountain, 8% valley, 75% plateau and 0.03% covered with water. According to Lay Gayint Woreda Office of Agriculture (2012), the *woreda* is covered by red soil (15%), brown soil (55%), black soil (15%), grey soil (10%) and others (5%).

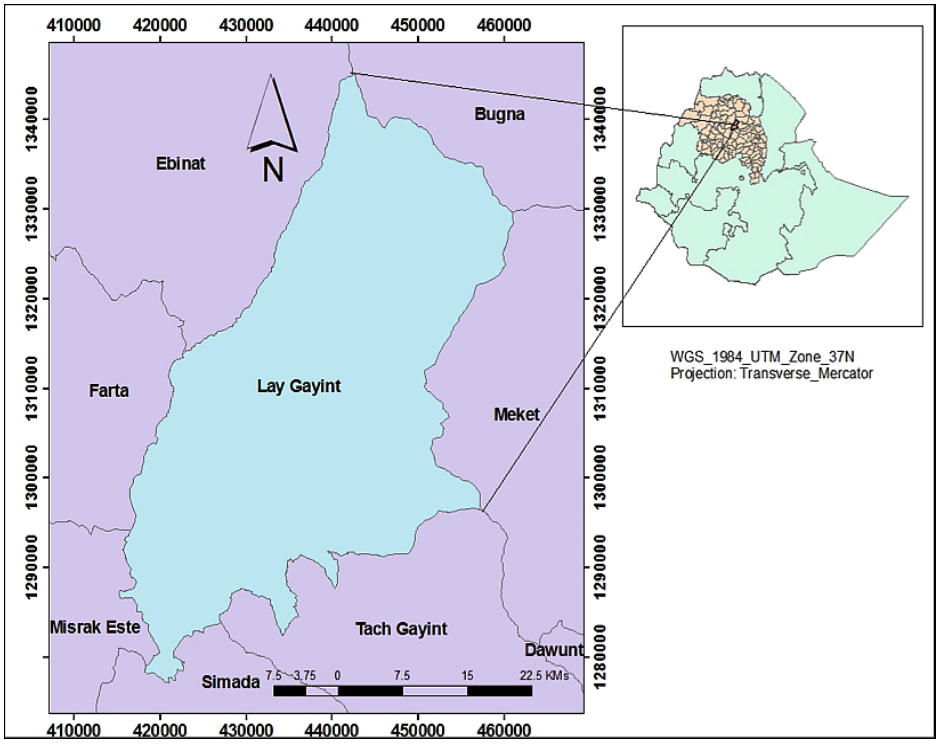

Figure 1: *Location Map of Lay Gayint* woreda

The maximum and minimum mean annual temperature of the *woreda* is 20° C and 8°C respectively. The annual rainfall of the *woreda* is between 600 mm and 1200 mm (Lay Gayint Woreda Office of Agriculture, 2012). The nature of the rainfall is erratic, short in duration, late onset and early offset as well as poorly distributed temporally and spatially. The livelihood of farmers is endangered by seasonality of rainfall, recurrent drought and variability of rainfall. The annual mean rainfall of the district for the last 27 years was 1053.61 mm. The small rainy season (*belg*), occurs between March and May and the long rainy season (*keremt*), occurs between June and September. Therefore, summer rainfall is the main rainy season for crop production.

According to Central Statistical Authority (2007) this *woreda* has a total population of 206,499 (104,401 male and 102,098 female). Out of these, 22,825 (11.05%) are urban dwellers and 183,674 (88.95%) rural dwellers with a total household (HHs) number of 39,638. Concerning the population distribution, 41% live in *dega*, 31% live in *woyna dega*, and 28% live in *kolla* agro ecology (Lay Gayint Woreda Office of Agriculture, 2012; Mesfin Wolde-Mariam, 1991). About 88.95% of the population depend on agriculture and the average land holding size of a household in the woreda is 0.75 hectare (Lay Gayint Woreda Office of Agriculture, 2012). Small-scale mixed agriculture is the dominant source of livelihood to the local people.

METHODS

Geo-referenced satellite images (Landsat TM) of 1984 and 2004 of Lay Gayint

Table 1: *Lay Gayint* woreda *land use classification*

Land use type	Area coverage (ha)	%
Cultivated land (annual crops)	68,649	44.33
Communal grazing land	22,160	14.31
Forest cover	1,023	0.66
Shrub land	8,150	5.26
Infrastructure and settlement	2,344	1.51
Bare land	52,540	33.93
Total	154,866	100.0

Source: Lay Gayint Woreda Office of Agriculture, 2012.

woreda, was downloaded freely from Global land cover facility (www.earthexplorer.usgs.gov). The *woreda*'s office have been doing land use and land cover classification in six major classes, namely: cultivated land, grazing land, forest cover, bush and shrubs land, infrastructure and settlement and bare land. Due to the difficulty to identify cultivated land from settlement and infrastructure, these two are merged and called cultivated land and settlement. Therefore, the classification is reduced to five, i.e. cultivated land and settlement, communal grazing land, forest cover, shrub land and bare land. Finally, a supervised classification was made to establish

the land use and land cover types of the two satellite images of 1984 and 2004, and was analyzed in percentages.

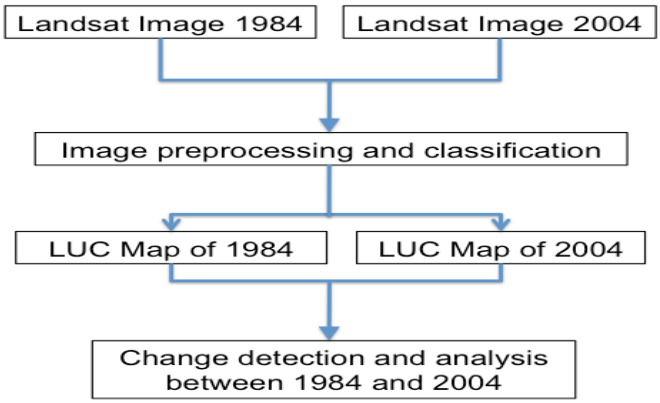

Figure 2: *Flow chart showing the general methodology of land use/land cover evaluation*

RESULTS AND DISCUSSION

As indicated in Table 2, the land use and land cover types in the study area are defined into five types, namely: cultivated land and settlement, communal grazing land, forest land, shrub land and bare land. The separation of cultivated land and settlement was not possible due to their intermingled pattern. For example, usually, rural settlements are encircled by farm plots. Because of this it was difficult to define specific land cover type for each. Therefore, cultivated land and settlement are classified as one class.

As indicated in Figures 3 and 4, the second greatest share of land use/land cover next to bare land is communal grazing land, which covers an area of 42,643.60 hectares (28%). Cultivated land and shrub land covers an aerial of

Table 2: *Types of land use and land cover in Lay Gayint* woreda

Land use and land cover class	Description
Cultivated land and settlement	Areas allotted to rain fed crop cultivation including annuals and perennials, mostly of cereals in subsistence farming and the scattered rural settlements included within the cultivated fields.
Forests cover	Areas covered by trees forming closed or nearly closed canopies; forest; plantation forest.
Shrub land	Land covered by small trees, bushes, and shrubs, in some cases mixed with grasses; less dense than forests.
Grazing land	Areas of land where small grasses are the predominant natural vegetation. It also includes land with scattered or patches of trees and it is used for grazing and browsing.
Bare land	Parts of the land surface which are mainly covered by bare soil and exposed rocks.

35,451.30 hectares (23%) and 14,083.40 hectares (9%) respectively. The least aerial coverage is forest, which accounts for only 3,610.61 hectares (3%).

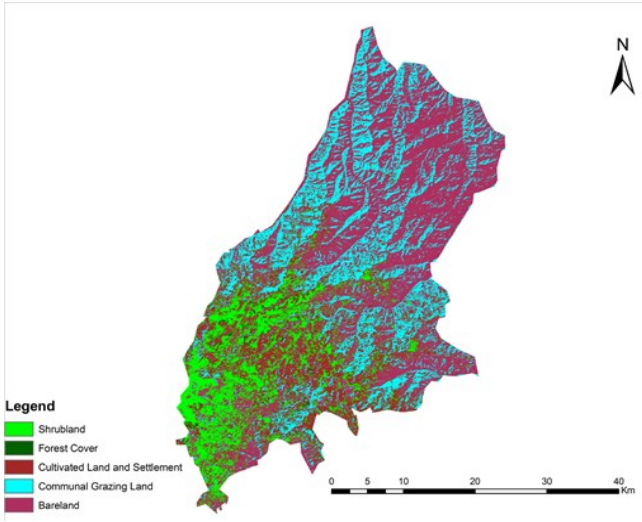

Figure 3: *Land use and land cover map of Lay Gayint* woreda *in 1984*

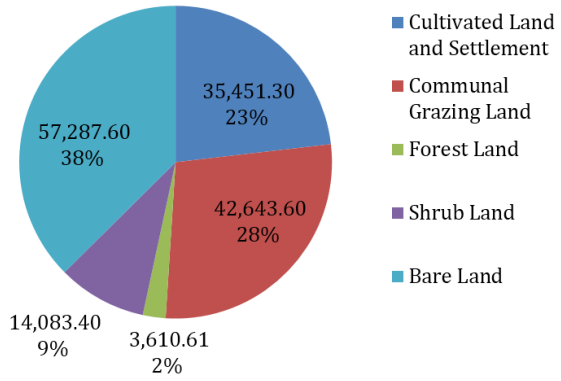

Figure 4: *Aerial coverage (in hectares) and percentage of Lay Gayint* woreda *in 1984*

As indicated in Figures 5 and 6, the greatest share of land use and land cover from all classes, except the bare land, is cultivated land, which covers an area of 53,816.00 hectares (35%). Communal grazing land and shrub land cover an area of 20,209.90.30 hectares (13%) and 10,085.80 hectares (7%), respectively. The least aerial coverage is forest, which accounts for only 735.80 hectares (0.48%).

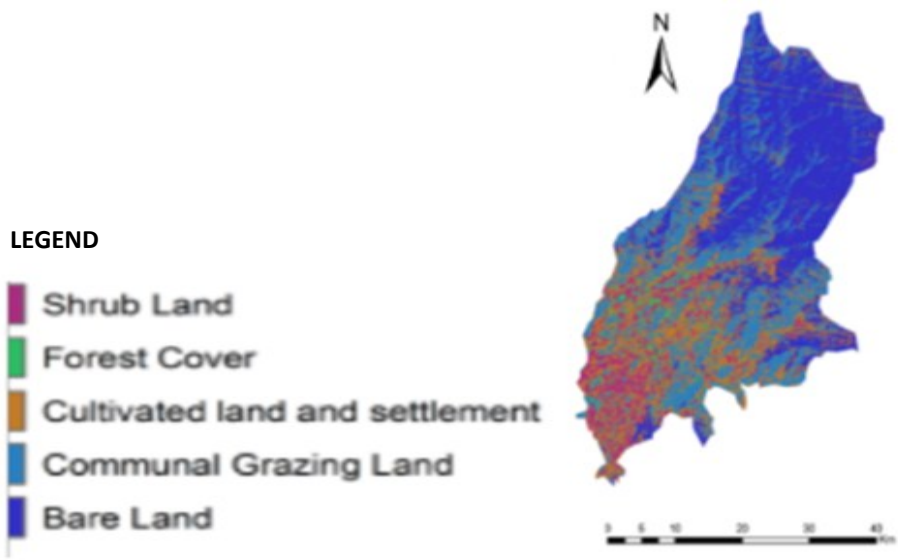

Figure 5: *Land use and land cover map of Lay Gayint* woreda *in 2004*

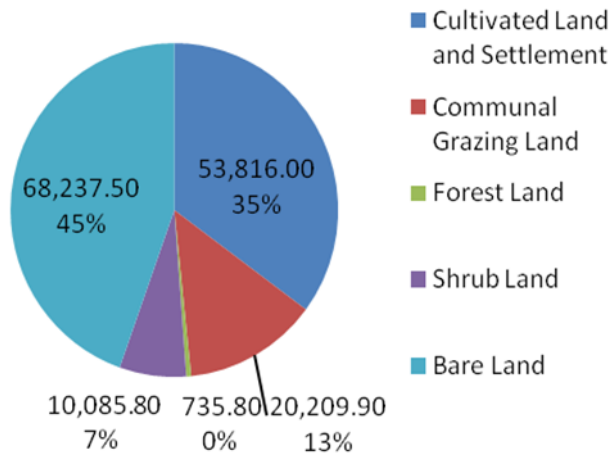

Figure 6: *Aerial coverage (in hectares) and percentage of Lay Gayint* woreda *in 2004*

An important aspect of change detection is to determine what is actually changing to what category of land use and land cover type, i.e. which land use class is changing to another type of land use class. This information will also serve as a vital tool in management decisions. This process involves a pixel-to-pixel comparison of the study year images through overlay analysis.

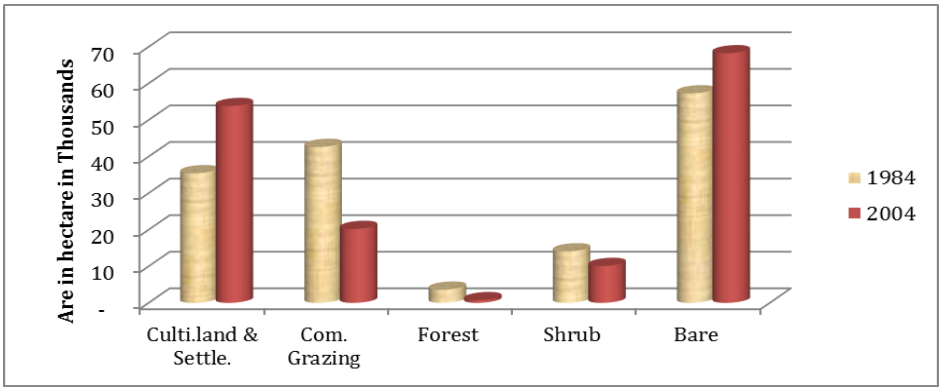

Figure 7: *Land use land cover types and trends in 1984 and 2004*

Pattern and areal extent of land use and land cover change

The change for cultivated land and settlement showed very high increase between 1984 and 2004. In 1984, the area under cultivated land and settlement coverage was 35,451.30 hectares (23.16%), which was escalated to 53,816.00 hectares (35.15%) in 2004. An additional 18,364.70 hectares of land was incorporated into this land use type. This is at the expense of forestland, communal grazing land and shrub land. The original land use increased by 51.80%.

The change for communal grazing land decreased highly between 1984 and 2004. In 1984, the area under communal grazing land coverage was 42,643.60 hectares (27.86%), which was reduced to 20,209.90 hectares (13.20%) in 2004. Of the total communal grazing land cover in 1984, 52.61% was converted into other forms of land use. Only 47.39% of the original area remained in the same category. An attempt to plant forage for livestock to reduce the pressure on communal grazing land and exercise zero grazing was not working as expected.

The pattern of change for forest cover showed a decrease between 1984 and 2004. In 1984, the area under forest cover was 3,610.61 hectares (2.36%), which declined to 735.80 hectares (0.48%) in 2004. Of the total forest cover in 1984, 51.80% was converted into other forms of land use. Only 20.8% of the original area remained in the same category. A large proportion of the forest, i.e. 79.62% land was transformed into other land categories. An attempt to recover the lost forest cover through afforestation program was never successful in the area.

The pattern of change for shrub land also showed a decrease between 1984 and 2004. In 1984, the area covered by shrubs and bushes was 14,083.40 hectares (9.2%), which was reduced to 10,085.80 hectares (6.59%) in 2004. Of the total shrub land in 1984, 28.39 % was converted into other forms of land use. 71.62% of the original area remained in the same category. The land cover/land use change in shrub is relatively less. This might be due to planting of eucalyptus trees on the highland parts of the *woreda*, as a result of which some of the forest covers in 1984 changed into shrub land.

The change for bare land showed a very high increase between 1984 and 2004. In 1984, the bare land was 57,287.60 hectares (37.42%), which was raised to 68,237.00 hectares (44.57%) in 2004. An additional 10,949.90 hectares of land was incorporated into this land use type.

Major drivers of land use and land cover changes

In the case of our study area, the total population increased by 40% between the years 1984 and 2004, i.e. from 123,900 in 1984 to 206,499 in 2004 (Lay Gayint Woreda Office of Agriculture, 2012). This implies the rural population who earn their livelihood from agriculture has increased. From this data we can induce that population growth in the study area was possibly a crucial factor that caused change in land use and land cover.

Land holdings

As is the case in most of north-central highlands of Ethiopia, the farm size of households for the study *woreda* was small. In the study area, the unit of measurement of land is *timad*: 4 *timad* is equivalent to 1 hectare and conversion was made on this basis. The average land holding size for a household was more than 1.5 hectares in the base year, whereas in 2004 this figure was reduced to 0.75 hectare (Lay Gayint Woreda Office of Agriculture, 2012). This shows that the land holding for a household was reduced by half when compared with the reference year. Hence, landholding is an important factor that caused land use and land cover change.

Livestock production

Livestock play a very important role for which agriculture is the major source of livelihood (Befekadu Degefe & Berhanu Nega, 2000). There was a significant increase in the livestock population of the study area, especially on small ruminants: sheep and goat (Lay Gayint Woreda Office of Agriculture, 2012). This shows that the number of animals is increasing while the size of the grazing land is decreasing. This in turn will result in over grazing, erosion, and land degradation.

Sources of energy

In Ethiopia, the most important sources of energy are fuel wood, charcoal, cow dung and crop residues; of which fuel wood covers about 85% of the energy source (Ethiopian Forestry Action Program, 1994). Similarly farmers in the study area use similar sources to satisfy their energy demand (Lay Gayint Woreda Office of Agriculture, 2012). This will have an impact on the change in land use/land cover of the area.

Impacts of land use and land cover changes

Land degradation has been the major negative impact of land use and land cover change in Lay Gayint *woreda.* The most common form of degradation is produced by sheet erosion (Lay Gayint Woreda Office of Agriculture, 2012). As our image analysis demonstrated, the area of bare land increased by about 10,949 hectares: 19% increase between 1984 and 2004. As a result, production that was obtained from this area was lost. Moreover, soil fertility

is reduced due to over utilization and improper use of the soil (Lay Gayint Woreda Office of Agriculture, 2012); this has critically increased the total use of fertilizer to counteract this decline in production. Due to this and other interrelated factors, a significant number of people in the *woreda*, about 80,000, have been facing food shortage and have been given food aid by the NGOs and GO's such as USAID (Lay Gayint Woreda Office of Agriculture, 2012) .

CONCLUSIONS

Finer-scale land use and land cover assessments generally involve the use of higher resolution spatial and field data (such as, data on vegetation structure, plant species type, etc), statistics or measures that relate to a condition, change or quality, or change in state of environment and socio-economic conditions. The analysis of this data allows knowing land use and land cover changes that have occurred in Lay Gayint *woreda* during the last 20 years, from 1984 to 2004. The methods this study used were remote sensing integrated into a Geographical Information Systems (GIS) environment, which provided an ability to characterize large assessment areas and establish reference conditions. Generally the situations of land use and land cover dynamics have a depressing effect on the local scale and on others because its consequences do not have clear boundaries. Therefore, there is an urgent need for local land use planning and design with conservation practices in the study area. In this area, forest land decreased by 79.62% between 1984 and 2004. An increasing demand for farming land, rural settlement and grazing land was the cause for change of forest land (Lay Gayint Woreda Office of Agriculture, 2012). Shrub land also declined from 14,083.40 hectares (9%) to 10,085.80 hectares during the last 20 years in the study area. This is due to high household energy demand of the peoples of the *woreda*. The lesser reduction of shrub land might be due to the fact that some forest lands are converted into this form of land cover.

The expansion of cultivated land at the expense of other land cover types resulted a decrease in the amount of fodder and the number of cattle. This has lead to shortage of animals required for plowing and other economical purposes. Small numbers of livestock also have an impact on the use of cow dung for manure. Moreover, the expansion of cultivated land into marginal land leads to more severe land degradation.

There has been a change in land cover during the past twenty years of the study period (1984 to 2004) in the *woreda*. For instance, forest land, communal grazing land and shrub land cover types declined during the study period, whereas cultivated land and bare land increased at the expense of forest land and shrub land. These changes have not taken place without negative consequences.

RECOMMENDATIONS

The study suggests a series of measures in order to improve the land use and land cover status of the *woreda* and thus safeguard the livelihood of the local communities.

Forest protection and recovery
Soil and water conservation measures through afforestation program are an immediate requirement. The lack of national forest policies or guidelines on utilization, protection and property right of forest land and an ever increasing demand of farming land exacerbated the rate of deforestation. Moreover, the lack of a single afforestation program to be used as a model and to be organized by either the government or non-governmental organizations has an influence in hindering actions of forest protection and recovery processes in the study area. Therefore, an attempt should be made to show a model afforestation practice on degraded lands.

Population policy
Changes in land use and land cover in the study areas are mainly caused by increasing population. The current household family size and its annual crop production are not proportional. Moreover, farmers were unable to improve the amount of production with the existing conventional farming practice. Therefore, enhancement of households' knowledge regarding the impact of population growth on their living situation, through family planning programs and sex education, has a paramount importance.

Alternative energy sources
Fuel wood is the main source of energy in the study area. To this effect, farmers should be encouraged to plant trees on their homesteads, hillsides and degraded lands instead of cutting trees from the existing forest. Rural electrification program, introduction of modern energy sources like kerosene, and introduction of fuel saving stoves, instead of using fuel wood in traditional three stone stoves has to be given priority consideration.

Improving literacy level of the community
In the study area, the level of illiteracy is high, despite the fact that the contribution of educated manpower is unquestionable. Farmers, therefore, should be encouraged to send their children to school. Moreover, school drop -out rate should be reduced by changing the attitudes of family heads through education. Under the present population pressure in the study area, intensification of agriculture (increasing productivity per unit area) is recommended. The contribution of literate farmers in the intensification of agriculture will be greater than that of illiterate ones. Therefore, both the government and the society should take an immediate action to increase the number of students and their enrolment in schools.

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ORIGINAL ARTICLE

SOCIAL VULNERABILITY TO CLIMATE CHANGE IN THE ABBAY BASIN, UPPER BLUE NILE OF ETHIOPIA

Menberu Teshome [1]

ABSTRACT

This paper assesses the social vulnerability to climate change in the valley of the Abbay-Beshilo, Upper Blue Nile Basin of Ethiopia. Data were collected using a survey of households and focus group discussions as well as from the global weather data for soil and water assessment tool, office documents and research reports. Climatic elements were analyzed using simple regression and standardized precipitation index, while social vulnerability index was used to calculate vulnerability scores for social capital indicators. The study found different social vulnerability scores for different indicators. Households were highly dissatisfied with the services given by local leaders. However, households were less vulnerable to climate change by policy-related indicators though discussants complain of the little or no benefits gained from the policy interventions. This study is the first assessment of relative levels of social vulnerability to climate change in the Abbay-Beshilo Valley of Ethiopia. Since social capital is so vital in reducing climate change risks during and after every disaster, it is essential to consider it when designing adaptation measures.

Keywords: Abbay Basin, climate change, Ethiopia, social vulnerability, standardized precipitation index

INTRODUCTION

Climate change is the greatest environmental challenge that current human generations face (Ajibade, 2013; Vincent, 2004). It is differently defined in almost every knowledge domain (IPCC, 2007; Kabote, et al., 2014). The most cited definition of climate change is that of the IPCC (2007), which defines it as a long-term change in rainfall, temperature and extreme weather episodes. Temporal and/or spatial variations of the mean state climate beyond individual weather events is also termed as climate variability (IPCC, 2007). These phenomena have potential impacts on water, food and nutrition, agriculture, human health, ecosystem, and infrastructure (IPCC, 2013; Kabote, et al., 2014). The impacts are differentiated by location, gender and wealth status. Fragile areas like the Abbay gorge are more vulnerable to climatic risks mainly due to unfavourable environment and over dependency on climate sensitive agricultural sector (Kabote, et al., 2014). In this regard, the work of Vincent (2004) also highlighted that future climate change will have potential spatial differentiation of impacts.

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Traditionally studies have concentrated on projections of climate change using models based on past analogues of climate variability and then making suggestions on how such changes affect human populations through changing patterns of weather and coastal flooding. However, such top-down approaches fail to take into account the vulnerabilities of human populations in terms of social indicators (Hahn et al., 2009; Houghton, 2009; Vincent, 2004). Assessing the likely impact of climate change is interlinked with the social dimension of vulnerability. Therefore, understanding how different societies socially tied to adapt to climate change is a key element of research (Hahn et al., 2009; Vincent, 2004). As a result, the field of vulnerability study has emerged to see the way in which human populations mediate the adverse impact of climate change through their social networks, relationships, organizational affiliations and institutions. This area of research marks one of the emerging research areas of society-nature relationships with key policy and practical applications. The index of social vulnerability has many applications in contributing to the growing field of vulnerability assessment; enhancing the ongoing debates on the notions of vulnerability and helping to interpret the conceptual framework of vulnerability assessment (Vincent, 2004).

Studies were conducted in Ethiopia on climate change and related issues. Some studies tend to focus on the different shocks in relation to growth and/ or consumption (Dercon, 2004; Dercon et al., 2005). Others examine the relationship between rainfall and crop production at the zonal, regional and national levels (Segele & Lamb, 2005; Woldeamlak, 2009). Some others analyze yield or monetary impact of climate change and adaptation measures using climate models (NMA, 2001; Temesgen, 2007; Yosuf et al., 2008; You and Ringler, 2010). A few other scholars also examine climate induced-hazards, impacts, responses and local innovations to climate change adaptation, restricted to the pastoral lowlands (Aklilu and Alebachew, 2009; Yohannes and Mebratu, 2009). Additionally, studies were carried out on perception and adaptation without integrating vulnerability (Conway & Schipper, 2010; Temesgen et al., 2009). Only Temesgen (2010) analyzed the vulnerability of agriculture dependent farmers using the integrated vulnerability assessment framework aggregated at regional level covering a wider geographical area having diverse biophysical and socio-economic contexts.

Reviewing these previous studies, it is found that there are no research works that treated social vulnerability to climate change in Ethiopia in any spatial scale using social vulnerability index, except blaming the recurrent drought, severe land degradation and misdeeds of the previous regimes. In this regard, scholars of climate-change contend that without understanding social vulnerability it is difficult to acquire a better knowledge of human adaptation to climate change (Adger, 1999; Kelly & Adger, 2000; Vincent, 2004; Wisner et al., 2004). This situation inspired the author to examine the local level social vulnerability to climate change by integrating different indicators in the Gorge of the Abbay-Beshilo, upper Blue Nile of Ethiopia. By developing an index, this can add social vulnerability to the existing knowledge domains of

biophysical vulnerability to climate change at the local level.

VULNERABILITY ASSESSMENT

Concepts of vulnerability

The most contested term for various scholarly communities is 'vulnerability', which refers to the degree to which a system is likely to experience harm due to exposure to a hazard usually associated with floods, droughts and poverty (Fusel & Klein, 2005; Turner II et al., 2003). Vulnerability has its origins in the natural hazards and food security literature (Cutter, 1996). The term vulnerability is now a central concept in the livelihood, food security, sustainability science, land-use change, natural hazards, disaster risks management, public health and global environment and it is increasingly used in climate change research (Fussel, 2006; Schroter et al., 2004).

Vulnerability is commonly considered to be the ability to anticipate, resist, cope with and respond to a hazard (Wisner et al., 2004). However, vulnerability definitions reveal a distinction in the literature between the two main epistemological approaches. The natural hazards school of thought arises out of a positivist vein and, hence, focuses on the objective studying of hazards. Under this approach, emphasis is placed on a particular environmental stress and vulnerability refers to the risk of exposure of an ecosystem to a natural hazard. In contrast, the human ecology and political economy schools of thought have arisen out of interpretive social science paradigms based on relativist and constructivist ontology In these cases, vulnerability refers to a particular group or social unit of exposure and especially to the structures and institutions–economic, political and social–that govern human lives (Vincent, 2004).

One of the heavily relied upon definitions of vulnerability in the context of climate change studies is from IPCC (2001, 2007). IPPC defines vulnerability as the degree to which a system is susceptible to, or unable to cope with, adverse effects of climate change, including climate variability and extremes. The same institution provides two more definitions that are not specified as natural, or social vulnerability, but fit into the separate climate research streams. From the natural standpoint, the IPCC defines vulnerability as "a function of the character, magnitude and rate of climate variation to which a system is exposed, its sensitivity and its adaptive capacity" (IPCC, 2001, p. 995). From a social point of view, it describes vulnerability as the degree to which a system is susceptible to injury, damage or harm. Along the same line, Houghton and Khandker (2009) explain vulnerability as a risk of falling into poverty in the future, even if the person is not necessarily poor in the present; it is often associated with the effects of shocks such as drought and floods with a drop in farm production. Thus, social vulnerability is typically broken into three overlapping components: exposure, sensitivity and adaptive capacity (Turner II et al., 2003).

Exposure is the magnitude, frequency, intensity, and duration of climate-related hazards such as hurricanes, droughts, floods and storms, changing

distribution of temperature and rainfall, which expose farmers' livelihood assets (IPCC, 2007). Sensitivity is the degree to which the rural household is adversely affected by the exposure to the changing climatic variables. Sensitivity can be measured by the proportion of people who have been facing food shortage, water scarcity, number of months in food shortage, and level of access to different services. Adaptive capacity on the other hand refers to people's ability to adapt and recover from climate exposure by facilitating access to livelihood resources for adaptation. Sensitivity and adaptive capacity largely depend on the main livelihood activities practiced by a farmer and the specific livelihood resources needed to carry out these activities (IPCC, 2007; Luers et al., 2003; Turner II et al., 2003).

In this line of argument, Schroter et al. (2004) noted that agricultural vulnerability to climate change in terms not only of exposure to higher temperatures, but also crops yield sensitivity to high temperatures and farmers' ability to adapt to the effects of that sensitivity by planting more heat -resistant cultivars or different crops. Thus, one can conclude that exposure, sensitivity and adaptive capacity are inherently intertwined (Gallopin, 2006). For example, greater amounts of exposure will lead to greater sensitivity, while adaptive capacity can reduce the system's sensitivity. In practice, these steps do not happen chronologically, but instead play a continuous role in enhancing or diminishing each other. Consequently, many studies combine sensitivity with exposure or combine sensitivity with adaptive capacity depending upon the indicator under consideration.

Theoretical frameworks of vulnerability assessment

There are three major theoretical frameworks used to explain vulnerability: the biophysical vulnerability, the social/socio-economic vulnerability and the integrated vulnerability. The biophysical vulnerability assessment framework tries to assess the risks and levels of damage to certain exposed units that arise from exposure to the hazards of a particular type and magnitude (Fussel, 2006; Schroter et al., 2004). This approach uses quantitative models to measure exposure and sensitivity of biophysical and socio-economic systems to the given environmental risk based on forecasts or estimates of climate prediction models, or by creating indicators of sensitivity for real or potential hazards, including their frequency. A key aspect of the biophysical approach is the clear distinction between two factors: one, the hazard characterized by its site, intensity, frequency and probability (Benson & Twigg, 2007) and, the other, the vulnerability of the degree of damage caused by a hazard. Therefore, it is mostly considered as the outcomes' endpoint of vulnerability (Fussel, 2006).

This approach has invited criticism assuming that humans are passive recipients of global environmental change and thus failing to capture their dynamic ability to mediate such hazards, either through resisting an event or coping with it. The reason is attributed to the fact that it has failed to consider the role of social structures and institutions that shape differential exposure and consequences (Turner II et al., 2003). The second limitation raised by scholars is that studies relying on climate scenario projections from

general circulation models (GCMs) suffer from uncertainty. In addition, methods relying on advanced climate projections and multiple international and national databases may be impractical for development planners working at the community level (Hahn et al., 2009). Therefore, this approach was not applied in this study.

The second vulnerability assessment framework is social/socioeconomic vulnerability, which is regarded as a priori condition of a household or a community conditioned by socio-economic and political contexts (Adger & Kelly, 1999; Fussel & Klein, 2005; Wisner et al., 2004). While some authors termed this approach 'socio-economic vulnerability' (Adger et al., 2004; Brooks, 2003), others chose the term 'social vulnerability' (Adger, 1999; Kelly & Adger, 1999; Vincent, 2004), and still a few others explained it as 'contextual vulnerability' (O'Brien et al., 2007).

The second-generation vulnerability studies apply this approach focusing on the local scale to enhance local capacity in the face of climate change. The theoretical approach focuses exclusively on people, asking who is the most vulnerable, how susceptible they are and why (Fussel, 2006). This approach assesses vulnerability based on variations in socio-economic dynamics, institutional characteristics, political status of people and social groups in the community in order to measure adaptive capacity (Fussel & Klein, 2005).

There are many works that explain vulnerability in the socio-economic vulnerability approach (Adger, 1999; Adger & Kelly, 1999; Vincent, 2004; Wisner et al., 2004). Wisner et al. (2004) point-out various socio-economic factors that can lead the system to vulnerability situations. These factors include economic imbalances, power disparity among social groups, knowledge dissemination, and discrimination in welfare and social protection. However, it is contended that violent conflict and illness can lead to a greater loss of life than the natural and human-induced hazards such as earthquake, drought, flood and famine.

This approach has also attributed vulnerability of the society to socio-economic and political factors. Studies argue that in reality environmental factors are creating variation in society (Cutter et al., 2003; Temesgen, 2010). For example, two or more groups found in similar social conditions, but characterized by different environmental attributes can have different levels of vulnerability to climatic stresses. Thus, Fogera, Dembia and Dera *woreda*s of the Amhara region of Ethiopia are more vulnerable to floods than Chilga and other *woreda*s because of geographic exposure keeping other social factors equal. The second limitation of this approach is its failure to consider variation in natural resource endowments to counteract the negative impact of environmental shocks. Although resource-rich households experience greater losses than the resource-poor, they can recover more quickly from a climatic stress.

Various lines of investigation show the inadequacies of biophysical and socioeconomic vulnerability frameworks. This recognition has led to the

emergence of integrated vulnerability assessment framework, which draws a range of physical, biological and social science disciplines using a range of methods (Fussel & Klein, 2005; Houghton, 2009). Integrated approach brings together critical insights from political-economy perspectives with the awareness of physical-human systems interaction (Adger et al., 2004; Brooks, 2003; Houghton, 2009). The two systems interconnect in all the ways. Natural elements are not isolated from the social and economic environment. Hence the latter cannot be interpreted in terms of their impact on people without taking into account social and economic conditions (Luk, 2011). Accordingly, this study used integrated vulnerability assessment approach guided with the sustainable livelihood framework as it integrated social capital indicators and climate variables.

STUDY AREA

The study was conducted in the Abbay Basin of Simada *woreda* (district), which is located in South Gondar Zone of the Amhara Region, about 774 km north of Addis Ababa and 209 km southeast of Bahir Dar city (Woreda Office of Agriculture, 2011). Simada lies between latitudes 11.00º and 11.5° N latitude and 38.10º and 38.40º E longitudes. Although the altitude of Simada *woreda* ranges from 1196 to 3250 m above sea level (asl) the studied *kebele*s are found in the *kola* climatic zone of Abbay-Beshilo Gorge with altitudes ranging from 854 to 1500 m asl (See Fig. 1).

The *woreda* is bordered in the southeast by the Beshilo River, which bounds it with South Wollo Administrative Zone, on the southwest by the Abbay River, which separates it from East Gojjam Zone, in the northwest by the Wanka River, a tributary of the Abbay, which bounds it with Estie *woreda*, and in the north and northeast by Lay Gaynt and Tach Gaynt *woreda*s respectively. This indicates that the *woreda* is almost totally inclusive in the Abbay River basin. Shrubs and thorny trees scattered or clustered in some areas characterize the vegetation cover. Most parts of the *woreda* have bare soils especially during dry seasons. Vegetation is mainly natural including woodlands and grasslands.

The *woreda* has three climatic zones: *kola* (60%), *woyna-dega* (30%) and *dega* (10%) (Tibebe, 2008). Meteorology data indicate that the mean annual temperature is 23º C. For the period 1979 to 2010 the overall rainfall amount and distribution varied throughout the time and was erratic (Refer to Section 4.1). Much lower total annual rainfall (554 to 847 mm) with the average annual rainfall of 687 mm was detected in the Abbay-Beshilo Gorge. The main rainy season extends from Mid-June to the beginning of September. July and August are the wettest months, while December, January and February are very dry months. This means that the area has high rainfall for the two summer months in the year with less or no rainfall during the other months of the year.

According to the Office of Agriculture, Simada has an estimated total population of 228,271, which means an increase of 22% from the 1994

Population and Housing Census data. This is an average of 4.2 persons per household. The population density of 102 persons per km^2 is less than the South Gondar Administrative Zone average of 145 people per km^2.

Almost all the population living in the *woreda* is dependent on rain-fed mixed farming (cultivation of crops and rearing of animals), as elsewhere in sedentary farming areas of Ethiopia. The major crops grown are sorghum, haricot bean, maize and *teff*. The main livestock are cattle, goats, sheep and equines. The majority of the households reported decreasing food crop and livestock production, that they could not cover their household expenses. Most of the poverty stricken areas have suffered from chronic food insecurity resulting from erratic distribution of rainfall, snowfalls, degraded farmlands, small landholdings, pests and various diseases infestations, livestock disease, malaria and other diseases affecting human beings. This has left the population dependent on food-aid for over the past thirty years. Agricultural

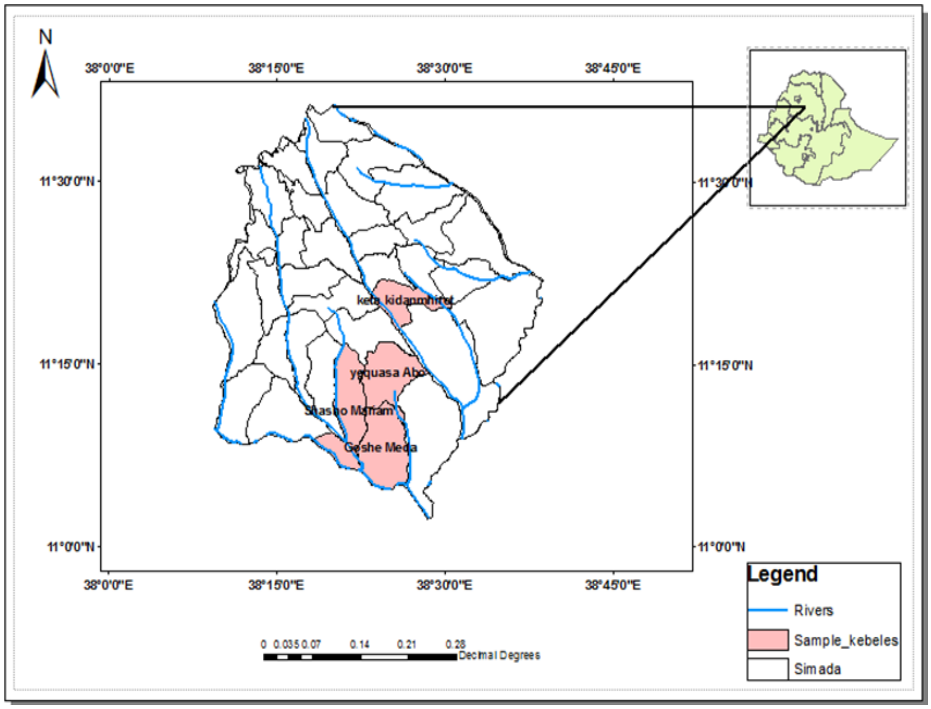

Figure 1: *Location of the study area*
Source: Own computation from Ethio GIS Database.

wage labor along with sesame weeding and harvesting opportunities in Metemma, Humera, and Quara are important income sources for the poor and the very poor and for many people who are dependent on PSNP and firewood sales to meet their food needs as well.

Poor health and nutrition status of the community was the primary general

problem of the people in the *woreda* as identified during the focus group discussion forums held with the local community. Low health service, which is the result of the insufficiency of health institutions as compared to the *woreda* population, inaccessibility to health services, limited supply of drugs, malnutrition and weak immunization coverage are among the most prioritized problems of the area. Different health indicators such as prevalence of different diseases, child and maternal morbidity and mortality, low status of personal and environmental sanitation, inadequate immunization coverage and poor health facilitation are the signs that point out the existence of the poor health status of the *woreda* communities.

The cultivated land-use dominates the study area. The human-occupied areas can be divided into: (1) cultivated areas that can be categorized as dominantly and moderately cultivated land use units with cereal crops, and some open grassland; (2) shrubby grassland, bush, open shrubby grassland and rock out crop; (3) nursery sites, plantation areas and open wooded land; and (4) small towns and other settlements. The cultivated areas cover generally the areas having from flat to gentle slopes, whereas moderately cultivated areas cover the area with moderately steep slopes. Shrubby grassland with scattered cultivation and open wooded land with bush cover the southern part of the study area and it is not suitable for cultivation due to the presence of deep river gorges (Tibebe, 2008).

METHODS

The study used integrated vulnerability framework approach, which assesses vulnerability based on social dynamics, institutional characteristics, political status of people and social groups in the community to measure adaptive capacity (Fussel & Klein, 2005) and climatic elements to measure exposure levels of the community to climate change risks. The proponents of this framework consider social vulnerability as the 'starting point', which is linked to the context and the human security. The assumption is that social factors can worsen or reduce the impact of climatic shocks by increasing or decreasing the sensitivity of the system comprising individuals, groups, communities, countries, sectors, etc. From the biophysical factors rainfall and temperature conditions were integrated with the socio-economic indicators to measure the exposure of the community to climate change.

Two research designs (cross-sectional and longitudinal designs) and two data sources (primary and secondary sources) were employed to generate data for this study. Cross-sectional designs were followed to gather data from farming households using a questionnaire survey at a point in time in order to examine the current situations of rural households. Longitudinal designs were used to record monthly climatic values from Global Weather data for soil and water assessment tool (SWAT; http://globalweather.tamu.edu/) and other government offices.

Data collection and analysis took place in two stages. Household survey preceded focus group discussions (FGDs). Thus, the first stage informed the

second stage. The results from the two stages were integrated in order to expand the scope and improve the quality of the results. This approach is known as sequential cross-sectional research design. The study used a household for the cross-sectional data as a unit of analysis during the survey because of its responsibility in decision-making on resource use. For the time -series climate data, the unit of analysis was the community because there was no possibility of getting climate data at the household level.

Household survey

Four *kebele* administrations (KAs) were selected using simple random sampling technique. Because of time and resource constraints only four *kola* KAs from the Abbay Gorge were selected. Further stratification of households in terms of annual income, household size and gender was not done because it was assumed that systematic random sampling can accommodate households having these different criteria in obtaining representative sample population. Sample size determination was carried out to obtain reliable data for the study. Yemane's (1967) sample size determination formula referred by Israel (1992) was checked within the determination of the sample household size for a better representation of the study population.

The formula provided 263 sample populations. Then, the 263 households were distributed to each *kebele* using probability proportional to size (PPS) method in order to ensure equal representation of households as there are different household sizes in each KA. The PPS method provided larger number of household heads for Yequasa Abbo (96), distantly followed by Shasho Mariam (69), Goshmeda (54) and Keta Kidanemihret (44) (See Table 1).

Sampling frames were obtained for each *kebele* by taking the list of all household heads from the *kebele* administrative offices. The sample households were drawn from each *kebele* using systematic random sampling method from the list of names after a certain sampling interval (K) that was determined by dividing the total number of households in the *kebele* by the predetermined sample size of each *kebele*. Next, a number was selected

Table 1: *Determined sample size by* kebele *administration*

Sample *kebeles*	No. of households	Sample size
Keta Kidanemihret	863	44
Goshmeda	1011	54
Yequsa Abbo	1857	96
Shasho Mariam	1302	69
Total	5033	263

Source: Woreda Administration Offices, 2012.

between one and the sampling interval (K) using lottery method, which is called the random start and was used as the first number included in the sample. Then, every Kth household head after that first random start was

taken until reaching the desired sample size for each *kebele*. Systematic sampling is to be applied only if the given population is logically homogeneous within the respective strata (*kebele* administration in this case), because systematic sample units are uniformly distributed over the population (Feige & Marr, 2012). In this case, sampling units are rural households who are uniformly distributed in the respective *kebele* administrations.

A structured questionnaire was administered to 263 randomly selected respondents drawn using systematic random sampling technique. Ten respondents at Yequasa Abbo *kebele* participated during pre-testing of the questionnaire to ensure validity and reliability of the data. Interviews to fill the questionnaires were done at respondents' homes and either the household head or spouse was contacted depending on availability. The questions asked were close-ended to capture social indicators, which explained vulnerability levels of surveyed households reside in the Abbay Basin.

Focus group discussions

Focus group discussions (FGDs) involved farming household heads. The study involved four FGDs, encompassing forty participants. The plan was to have six to fifteen members per FGD for effective participation and good quality of data; hence participants ranged from eight to twelve across the four *kebele*s. This aimed at enabling participants to take part in the analysis of the issues of social assets and extreme weather events. It has also the purpose of obtaining in-depth information on perceptions and ideas of the groups on social vulnerability to climate change. That is, this method addressed the cooperation culture of the society and the occurrence of extreme weather events as compared to the past. This method helped to triangulate the household survey and meteorological data. The uses of this data gathering method is recognized by Creswell (2012) by stating that qualitative inquirers triangulate among different data sources to enhance the accuracy of a study. Triangulation is the process of corroborating evidence from different individuals, types of data, or methods of data collection in descriptions and themes in qualitative research. Discussions were recorded in a notebook. Grass-root level extension officers, land administration experts and *kebele* leaders were consulted for clarification on certain issues.

Data analysis

Analyses of climate change indicators demand various quantitative and qualitative methods. The quantitative methods include simple regression (SR), standardized precipitation index (SPI) and social vulnerability index (SVI) complemented with descriptive statistics like mean, percentage, maximum and minimum values. Illustrations such as line graphs, bar graphs and spider diagrams made clear the results of the study on social vulnerability and exposure trends.

SR was used for analyzing temperature and rainfall trends. When we examine the relationship between quantitative outcome and single quantitative

explanatory variable, simple linear regression is the most commonly used method in order to detect and characterize the long-term trend and variability of temperature and rainfall values at annual time scale. The parametric test considers the SR of the random variable Y on time X. The regression coefficient is the interpolated regression line slope coefficient computed from the data as used by Mongi et al. (2010) is:

$$Y = \beta\dot{x} + c \quad [1]$$

where, Y = Physical factor (changes in rainfall and temperature) during the period; β = slope of the regression equation; x = number of years from 1979 to 2010; c = regression constant.

The standardized precipitation index (SPI) was used to identify the duration, magnitude and intensity of droughts during 1979 to 2010 using annual rainfall data. The SPI is a statistical measure indicating how unusual an event is, making it possible to determine how often droughts of certain strength are likely to occur. The practical implication of SPI-defined drought, the deviation from the normal amount of precipitation, would vary from one year to another. It can be calculated as:

$$SPI = \frac{x-\vec{x}}{\sigma} \quad [2]$$

SPI refers to rainfall anomaly (rainfall variance, irregularity and deficit) on multiple time scales; X represents annual rainfall in the year t; X is the long-term mean rainfall; and σ represents the standard deviation over the period of observation (McKee et al.,1993, cited in Woldeamlak, 2009). Hence, the drought severity classes are:

Extreme drought (SPI<-1.65);
Moderate drought (-0.84 > S > -1.28),
Severe drought (-1.28 > S > -1.65);
No drought (S > -0.84).

Having quantified the SPI values, drought duration, magnitude, and intensity were analyzed. Drought duration is the period between drought-starts and drought-ends expressed in months or years. Drought magnitude (DM) is the sum of the negative SPI values for all the months or years within the period of drought (McKee et al., 1993). Mathematically it can be expressed as:

$$DM = \sum_{j=1}^{x} -(SPI\ ij) \quad [3]$$

where, j starts with the first month/year of a drought and continues to increase until the end of the drought (x) for any of the i time scales.

Drought intensity (DI) is the ratio of the drought magnitude of the duration event, which can be expressed as Mi/Li, where Mi is drought magnitude and Li is the drought duration calculated from the SPI. Although most drought analysis used the monthly time scale, the yearly scale was selected for the

purpose of this study. If the monthly scale had been used, the presentation would have been complicated and would have made the results and discussion bulky.

Social vulnerability index

Assessment of the vulnerability levels of the farmers was done using the social vulnerability index (SVI) based on the household survey data considering functional relationships of indicators with vulnerability. As the creation of social vulnerability index has several applications, it contributes to the growing field of vulnerability assessment, adds to the ongoing debates about notions of vulnerability and helps to define the conceptual framework of vulnerability assessment (Vincent, 2004).

The SVI were constructed using equal weighting approach to measure households' access to a set of social assets and climate change exposures (Hahn et al., 2009). On the basis of the conceptual framework, indicators were selected for four components of social capital and climatic factors such as temperature, rainfall distribution and extreme weather events using expert judgment, observation and previous studies. The indicators were changed into standardized index using the following equation (ICRISAT, 2006; Sudarshan, 1981; Sullivan et al., 2002; UNDP, 2010):

$$\text{Social vulnerability index (SVI)} = \frac{\text{Observed values} - \text{Minimum values}}{\text{Maximum values} - \text{Minimum values}} \quad (3)$$

This method of normalization takes the functional relationship between the predictor variable and vulnerability levels of households. International Crops Research Institute for the Semi-arid Tropics/ICRISAT (2006) identified a type of relationship: vulnerability increases with the increase (decrease) in the value of the indicator. In this type of relationship, the higher the value of the indicators, the more is the vulnerability. For example, the larger the change in temperature, rainfall, and distance indicators, the more will be the vulnerability of the place or the community to climate change. In this case, the variables have a positive functional relationship with vulnerability and hence the normalization was done using equation 3. For these types of variables, the average values are taken as observed values. For variables that measure frequencies of events, the minimum value is set at 0 and the maximum at 100. For indicators, which assumed to have an inverse relationship (adaptive capacity indicators) with vulnerability, the inverse scoring technique was used in the standardization of values for each social indicator by equation 4 based on ICRISAT (2006) and NMA (2007).

$$\text{Inversed Social vulnerability index (ISVI)} = \frac{\text{Maximum values} - \text{Observed (average) values}}{\text{Maximum values} - \text{Minimum values}} \quad (4)$$

In this case, let us consider the number of relatives in a village of households, a high value of this variable implies better off households in the study site. So the rural households will have more capacity to cope with the impact of climate change. Put it differently, the vulnerability levels will be lower and the

number of relatives in a village has an inverse functional relationship with vulnerability.

According to equation 4, an indicator with the least value will have the highest standardized value. By taking the inverse of the value of the indicator, one can create a number that assigns higher values to households with a lower number of livelihood activities and vice-versa. Normalizing vulnerability indices for each indicator on a scale of 0 to 1 allows calculating mean scores for each major component using equation 5 (Hahn et al., 2009):

$$\text{Average social vulnerability index (SVI)} = \frac{\sum_{i=1}^{n} \text{Index}}{n} \quad (5)$$

where, SVI is one of the four main components for social capital such as networks and relationships (NR), organizational affiliations (OA), policy (P) and leadership and service delivery (LSD); Index refers to the sub-components, represented by i, which make up each principal component, and n is the number of sub-components in each major component. For example, the average index of the networks and relationship (NR) component can be calculated as:

$$\frac{NR_1 + NR_2 + NR_3 \ldots\ldots + NR_n}{N} \quad (6)$$

By applying the same procedure, composite indices were computed for other sub-components and then for the overall vulnerability levels of households residing in the Abbay Basin. Once the index values for each component were calculated, the composite index was computed using the weighted average with the following equation to obtain the social vulnerability level (SVI) (Hahn et al., 2009):

$$SVI = \frac{\sum_{i=1}^{7} Ni\ NCi}{\sum_{i=1}^{4} Ni} \quad (7)$$

where, SVI is social vulnerability index equals the weighted average of the four important components; the weights of each main component, Ni is the number of indicators in sub-components that make up each major component (NCi).

The quantitative analysis was complemented with qualitative methods. The collected qualitative text or word information through in-depth interview and writing field notes during observations were analyzed. Before directly getting into analysis, collected data were converted into word processing documents and field notes were read to begin the process of analysis.

RESULTS AND DISCUSSION

Temperature and rainfall changes

The temperature is a critical determinant of plant growth and animal survival. Therefore, the analysis of temperature can be important in many situations where crops, livestock, stored products, pests and diseases are affected by its variability. The meteorological data showed that annual temperature in the study area had been in increasing trend for the last three decades.

Figure 2 presents the maximum (Tmax), minimum (Tmin) and mean temperature (Tmean) trends of the studied area over the period of 1979 to 2010. The estimated trend line for average annual temperature is y = 0.052+18.49. The trend line has a positive slope indicating that the average temperature has increased by 1.61° C over the past 32 years. On decadal time scales, it rose by 0.50° C. This indicates that there was faster rate of temperature increase in the studied site. The rate of increase in the studied site was also faster than the national level increase (0.23° C-25° C/decade), which was observed over the past fifty five years.

The Abbay-Beshilo Gorge area is drought affected. Drought is a natural hazard, which can be marked, by precipitation deficiency that threatens the livelihood resources and overall development efforts of nations or specific places by exacerbating water shortage. Therefore, analysis of drought frequency (pattern), duration, magnitude and severity is highly demanded in order to design appropriate actions.

Figure 3 shows the standardized precipitation index for the study site (1979 –

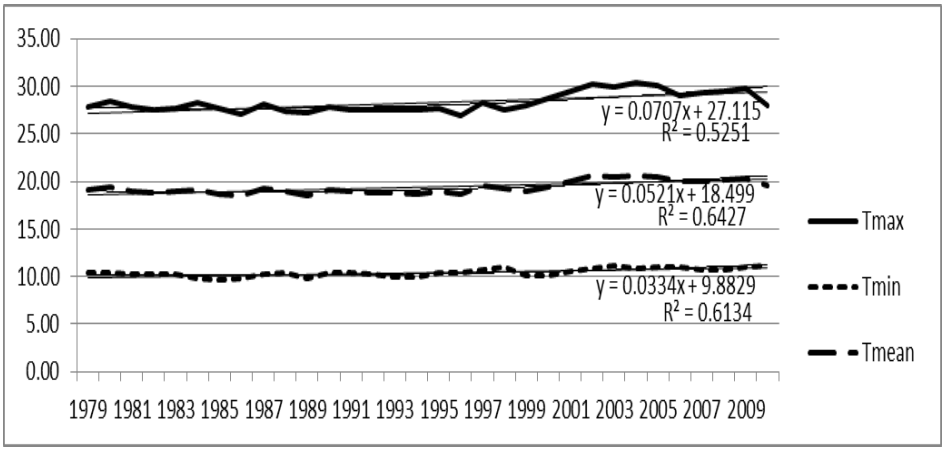

Figure 2: *Temperature trends in the studied site*
Note: Tmax – maximum temperature Tmin – minimum temperature Tmean-mean temperature.
Source: Computed from NMA and Global Weather Data [http:// Globalweather.tamu. edu/].

2010). It is clear from the figure that rainfall is characterized by periodic fluctuation of wet and dry years. Out of thirty two years of observation, fifteen years (46.88%) recorded below the long-term average annual rainfall and the rest fifteen years recorded above the long-term average. Only one year received nearly normal rainfall in the period. Before 1983, the rainfall was above the long-term average whilst from 1983 to 1995, it was below the long-term annual rainfall. Again, in 1986 positive SPI value was detected in spite of its failure in 1987. Likewise, a positive trend was identified from 1988 to 1990, but drier conditions were experienced in 1991. Once more, a slight recovery was observed from 1992 to 1993 with alternate rise and fall until 1998. Most of the negative anomalies occurred after 1998. The amount of rainfall in the years 1984, 1987, 1997, 1999, 2002 and 2008 were the lowest on record in the observation period, marking the worst drought years. Then, the rainfall indicated a recovery in 2006 from the low values of 1999 to 2005, but went down in the next three years, marking a large decline in 2008 and 2009. Again, the rainfall showed significant recovery in 2010. Five flood years were identified with high SPI values in 1980, 1986, 1989, 1994 and 1998 with SPI values of 1.5, 1.95, 1.35, 2.26 and 1.56 respectively.

Having quantified drought-based SPI values, the drought duration, magnitude, and intensity were analyzed. Although most drought analysis used the monthly time scale, the yearly scale was selected for the purpose of this study to reduce complications of the results. The result indicates that 13.53 drought magnitude and 1.04 intensity were computed in fifteen years of duration.

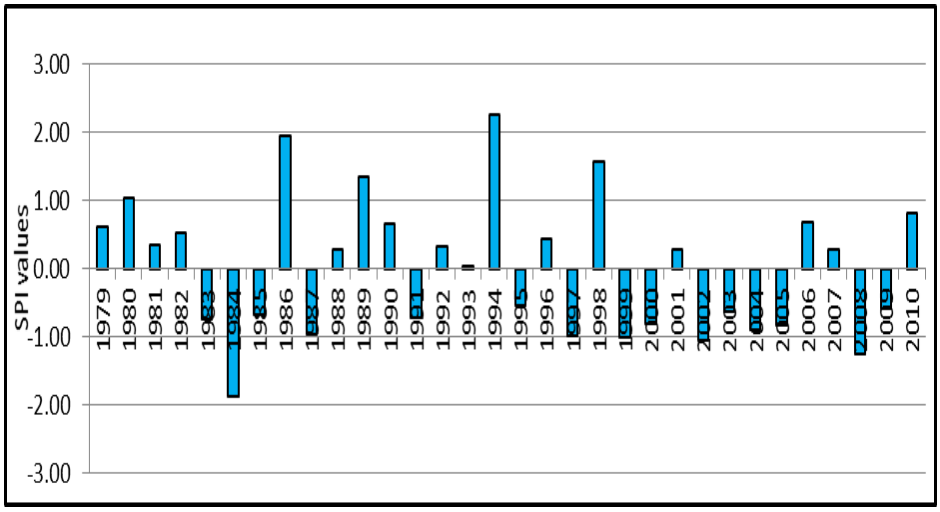

Figure 3: *Standardized precipitation index (SPI) for the study area*
Source: Computed from NMA and Global Weather Data [http://Globalweather.tamu.edu/].

Social vulnerability to climate change

Vulnerability is associated with social capital, which can facilitate coordination and cooperation in times of crisis for material gain or even resolve disputes (Barungi & Maonga, 2011; Nyangena & Sterner, 2008). In this study, the households' social capital was assessed by using components such as networks and relationships, organizational affiliations, policies and strategies, as well as decision-making and service delivery. See results in Table 3 for each indicator and Figure 5 for a summary of the sub-components of social capital.

Networks and relationships

The forms of social networks and relationships examined in the study area were the number of relatives in a village (kinship), degree of attachment with relatives and neighbors (friendship), farmer-to-farmer extension, helps received from relatives or neighbors, and borrowings from and lendings to relatives. The survey results indicate that many of the respondents were involved in several social activities and networking with relatives and non-relatives involving resource, work and information sharing. However, the surveyed households were not free from being vulnerable to these indicators.

By the number of relatives in a village, the households had a social vulnerability score of 0.94, indicating very high degree of vulnerability to climatic risks. The reason is that the average number of relatives in a *got* (village) was 8.79. However, number of relatives in a village may not be sufficient condition to measure the vulnerability levels of the households without supporting it with degree of attachment, because a person having a large number of relatives may be in conflict with them as opposed to a person who has strong attachments to his/her limited number of relatives and non-relatives. Thus, the latter may have better adaptive capacity than the former who is with higher vulnerability level. The results on the degree of attachments of households with relatives and neighbors provided 0.62 social vulnerability score (Table 3). This means households having weak ties with their relatives and neighbors were detected there, indicating limited capacity against the impact of climate change. From this, we can infer that poor attachment of households with their relatives and neighbors has strong association with natural resource depletion and high poverty level.

Concerning the cooperative tradition of the society, households have very limited capacity. Over 74% of the households reported that the cooperative tradition of the society has been in a decreasing or worsening condition from time to time. Although better access to livelihood assets and people's good attachment with relatives and neighbors have positive influences, inverse relation is obtained in the more vulnerable sites. The results also showed that by borrowing money from relatives and non-relatives, the households were highly vulnerable by 0.81 score. Again, the households were more vulnerable with regard to lending money to relatives and non-relatives having 0.85 score (Table 2).

Table 2*: Normalized vulnerability indices for major components and indicators*

Social vulnerability indicators	Measured values and indices				
	Unit	Observed	Maximum	Minimum	LVI
Networks and relationships indicators					
Average number of relatives in a village	No.	8.79	150	0	0.94
HHs who have loose ties to relatives/ neighbors	%	62.4	100	0	0.62
Societies' cooperation/support culture	%	73.7	100	0	0.74
HHs who do not get farmer-to-farmer extension/ month	%	42.4	100	0	0.42
HHs who do not get help from relatives/neighbors/6 month	%	35.0	100	0	0.35
HHs who do not get loan from relatives/neigh/6 months	%	81.4	100	0	0.81
HHs who do not lend money in the past 6 months	%	85.2	100	0	0.85
Average networks and relationships vulnerability					0.68
Organizational affiliation indicators					
HHs who are not members of farmers' cooperatives	%	74.9	100	0	0.75
HHs who are not members of credit and saving group	%	90.9	100	0	0.91
HHs who are not members of religious groups	%	37.3	100	0	0.37
HHs who are not members of other organizations (*Edir*)	%	98.5	100	0	0.99
HHs who have no relative holding position in *kebele* administration	%	67.7	100	0	0.68
Average organizational affiliation vulnerability					0.74
HHs who feel unsecured on their farmland	%	21.3	100	0	0.21
HHs who are not encouraged by land certificate	%	13.3	100	0	0.13
HHs who have no information on government policies	%	36.1	100	0	0.36
HHs who are dissatisfied with government policy	%	33.8	100	0	0.34
HHs who are dissatisfied with NGOs role in development	%	33.8	100	0	0.34
Average policy related issues index					0.28
Leadership and service delivery					
HHs who are unhappy by their local leaders' decisions	%	75.3	100	0	0.75
HHs who are not participated in their local leaders election	%	21.7	100	0	0.22
Frequency of visits to HHs by DAs in a cropping season	Freq	1.0	10	0	0.91
HHs who are not visited by DAs in a cropping season	%	45.6	100	0	0.46
Average Leadership and service delivery index					0.58

Source: Household Survey, March to September, 2012.

Different forms of supports the households have gained, from relatives and non-relatives, provided relatively little contribution for the households' social vulnerability index value in the study area with LVI score of 0.35. Although the cooperative and support culture of the society was reported to be on a decreasing situation, the respondents involved on some social and economic activities especially in farming, harvesting, threshing, keeping livestock, marketing, taking sick family members to health institutions, house construction and sharing useful information, to mention a few (e.g. Figure 4).

Figure 4 illustrates rural people's cooperation in harvesting teff during untimely rain in November 2012. The results from group discussion that those give-and-take types of co-operations are still working to some extent, but sharing crops, some amount of money, and animals for different agricultural and marketing purposes have been greatly decreasing with negative implications on the adaptive capacity of the studied households.

In the aggregated social vulnerability indices, the households scored 0.68 by the networks and relationships component of social capital (Table 3). By almost all the indicators, the households had limited capacity in terms of networks and relationships to undertake adaptation/coping with activities against the impact of climate change. This may result from the very high level of vulnerability of households in terms of other livelihood resources in the study area. From this, one can infer that there is strong network and relationship among people in the places where there is relatively better access to different livelihood resources while the reverse is true in the areas where there is limited or no access to such resources. As Temesgen (2010) argued, in the vulnerability and adaptation studies as well as networks and relationships can play a significant role in information exchange and in facilitating help and support with the people during the climatic hazards and, thereby, in reducing vulnerability to climate change impact. Other studies noted that networks and relationships are assets, which exist in the networked relationships to cope up with the impacts of climate change and related issues (Adger, 2003; Luk, 2011). Wisner et al. (2004) also argue that households that have access to social networks are less vulnerable to natural

Figure 4: *Farmers cooperation in agricultural activities, November, 2012*
Source: Own field Photo, November 2012.

hazards. These represent social safety nets and a form of informal grass-roots insurance available to the household during climate-related crisis (Vincent, 2007).

Organizational affiliations

Farming household's organizational affiliation in this study was examined based on membership status of households in farmers' cooperatives, saving and credit groups, religious groups, traditional help associations (*edir* and *equib*), and relatives holding positions in *kebele* administration. The survey results indicated that the households had highly limited membership status in different help associations because about 99% of them had no membership status in traditional help associations. In terms of membership status in saving and credit groups, 91% of the households were found to be not attached to saving and credit associations. Similarly, 75% of the households were found without membership status in farmers' cooperatives, both implying limited access in securing useful information, agricultural inputs and financial resources necessary for adaptation to climate change. Nearly, 68% of the respondent households had no relative holding position in the *kebele* administration. About 63% of the households had no membership status in religious groups indicating higher degree of vulnerability of the households at the times of climate change induced risks (See Table 3).

Overall, households' level of social vulnerability scored 0.74 by organizational affiliations, indicating limited capacity and in turn greater vulnerability level of households to climate change-induced risks (Table 2). Other studies argue that as vulnerability and adaptation are dynamic social processes, the ability of societies to adapt is determined, in part, by the ability to act collectively. Being members of any association or group is crucial for reducing vulnerability by enhancing adaptive capacity of farming households through information exchange, experience sharing and material and financial support in times of climatic disasters (Adger, 2003; Luk, 2011). In the light of this argument, other scholars also argue that associations can build trust, confidence and moral values, and provide information that will help the households to adapt to climate change (Nyangena & Sterner, 2008).

Policy issues

Policy processes are important determinants of vulnerability and adaptation to climate change. Accordingly, land tenure security, land certification, flow of policy information, and the benefits the households acquire from the current policies were examined under this issue. The results indicated that households had an aggregated vulnerable score of 0.28 by policy issues. When we see indicator wise, equal vulnerability score (0.34) was obtained by policy deliverables and by the NGOs' role in supporting local development efforts for reducing socio-economic and environmental problems. Limited numbers of NGOs have focused on relief provision and safety net programs in the study area. The households reported that there is no significant improvement in their living standard by both the government and NGOs' interventions. The surveyed households had a social vulnerability score of 0.36 by access level to current policy information (Table 2). Due to its isolated

and inaccessible nature and its difficult terrain arrangement the Abbay-Beshilo Gorge is one of the least preferred areas for the government's and the NGOs intervention. This has in turn led to gain limited or no benefits from these kinds of intervention. In addition to being the least preferred area for development interventions, the inaccessible topographic setting has made the households more vulnerable in terms of information flow on potential hazards, new technology options and actual implementations of policies and strategies.

Leadership and service delivery

Different levels of government institutions play a crucial role in helping communities by enhancing their adaptive capacity against climate change. All levels of government, such as federal, regional, zonal, *woreda* and *kebele* are involved in administering the community and in initiating other development activities. In this context, households' level of satisfaction with the decisions and/or services provided by their local leaders, households' participation in their leaders' election processes, number of households who have been visited by development agents in the past cropping season and frequencies of visits per cropping season were taken as indicators to assess the vulnerability levels of rural households to climate change impact. The results indicated that the households had a social vulnerability of 0.58 by leadership and service delivery indicator. Consequently, in terms of levels of satisfaction from the services and decisions provided by local leaders, the score was 0.75, indicating the highest vulnerability to climate change risks (See Table 3). This may be attributed to the fact that again the inaccessible nature of the area has posed difficulties for the zonal and *woreda* officials to undertake continuous monitoring on the grass-root-level decision-makers and service providers so that focus group discussants reported some kind of bias and discriminations in getting some benefits.

Another important indicator considered in social vulnerability analysis was

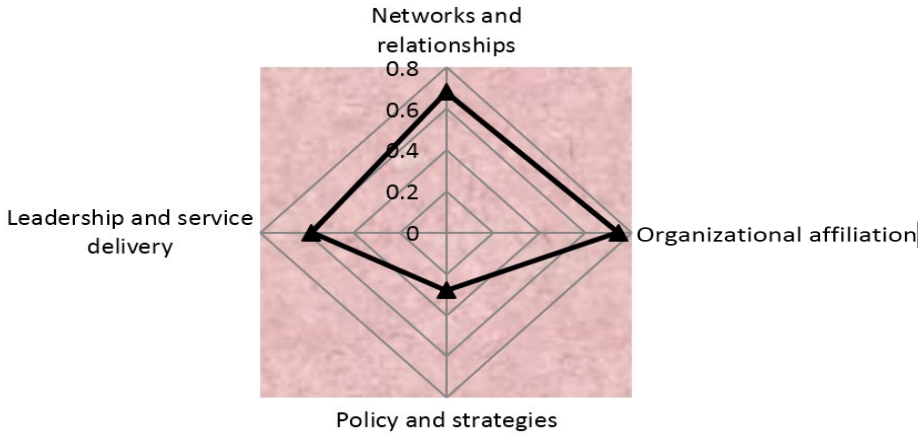

Figure 5: *Vulnerability of households measured by social capital components*
Note: index value of 0 means no or very low vulnerability and vulnerability increases as SVI values increase in the radar diagram outwards from the center.
Source: Household survey, March to September 2012.

access to extension services (whether the households accessed extension services or not and how often). The inverse scoring technique depicted in Equations 4 indicated that by the development agents' (DAs) frequency of visits to households in the past cropping season, the households had 0.91 score, indicating very limited extension services provided to the rural households. Even 46% of the surveyed households reported that they had never received any visit from DAs in the season considered (Table 2). From this, we can infer that neither extension visits nor visits and trainings have brought significant capacity increment in terms of skill, knowledge and attitudinal changes in adopting new adaptation technologies. In fact, development agents remain at the edge, never reaching the farmer and service packages may not fit the Abbay-Beshilo Gorge.

Figure 5 presented the average vulnerability score for the sub-components of social capital. It is clear from the spider diagram that in terms of organizational affiliations, households were found to be highly vulnerable (0.74) implying very limited affiliations of households to different formal and informal organizations. Again, in terms of networks and relationships, they were more vulnerable by 0.68 score and in terms of leadership and service delivery the scored was 0.58. Despite the challenges to identify the indicators that reflect the local social assets, including them in climate vulnerability assessment is essential as many adaptation behaviors rely on collective insurance mechanisms such as religious groups, agricultural cooperatives, credit groups, and traditional help associations. In terms of policy directions, it seems that the households are less vulnerable to climate change impact.
However, the data gathered from the household surveys in the study area does not show what farmers have experienced. Such a lack of congruence between the survey data and what people actually experienced is understandable. In the discussion sessions, people complained of little and/ or no benefits obtained from the policy interventions though the government has declared double-digit economic growth over the last eleven years.

CONCLUSIONS

Climate change is a very real fact that will inevitably affect human populations in the coming decades. In this paper, an empirical index was created to assess the rural households' relative social vulnerability to climate change in the Abbay-Beshilo Gorge of Ethiopia. A theory-driven aggregate index of social vulnerability was formed through the equal weighting approach of four composite sub-indices: networks and relationships, organizational affiliations, policy strength, and leadership/service delivery. Vulnerability assessment provides a framework for identifying and measuring these very important components of social capital, which may create differential vulnerability situations of the studied community.

The outcome of the current vulnerability study in terms of social capital puts the rural households of the study area in the most vulnerable position to climate change impact. Whilst the studied households were found to be the most vulnerable social groups to climate change by organizational affiliations

(0.74), networks and relationships (0.68) and leadership and service delivery (0.58), they were the least vulnerable in terms of policy deliverables (0.28). It is important to remember, however, that this is a relative scale and it should not imply that the latter social vulnerability component is entirely resilient.

Despite the fact that better access to livelihood assets and people's good attachment with relatives and neighbors have positive influences, inverse relation is obtained in the studied area. The indices are grounded in existing literature on vulnerability and use the most important local level data sets. Thus, this study marks the first robust assessment of relative levels of social vulnerability of rural households to climate change in the Abbay-Beshilo Gorge. Since social capital is so vital in reducing climate change risks during and after disaster, it is required to consider the same when adopting adaptation and mitigation policy measures. Thus, the government should try to maintain intact the social networks and make the best use of the existing social networks in the development processes.

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BOOK REVIEW

Archaeology: English-Amharic Dictionary. የአርኪዎሎጂ እንግሊዝኛ-አማርኛ መዝገበ ቃላት. By Hasen Said and Asamrew Dessie. Addis Abäba: Shama Books, 2010-2011. Pp. 80; illustrations. ISBN: 978-99944-0-050-8. Price: 95.00 ETB.

Based in Addis Ababa, Shama Books is an important Ethiopian publisher of scholarly literature. Since the year 2000 its production has expanded with a series of finely edited books written by prominent authors and encompassing fields from literature to social sciences and the humanities. *Archaeology: English-Amharic Dictionary* is a new contribution to the rich catalogue of the Addis Ababa publisher. Its authors, Hasen Said and Asamrew Dessie, are professionals in the fields of archaeology and heritage management in Ethiopia. Dr. Hasen Said is a trained prehistorian with a large career as a museum custodian; for many years he has been the head of the Museum of the Institute of Ethiopian Studies in Addis Ababa. Asamrew Dessie is a trained archaeologist who has taken part in several excavation campaigns.

Archaeology: English-Amharic Dictionary joins a trend within the different scholarly fields to publish thematically oriented dictionaries to help coin a standard Amharic vocabulary for literary and scholarly writing. Thus, in the humanities and social sciences dictionaries and glossaries on oral poetry, linguistics, theatre, theory of literature and law have appeared within the last years. In the 'harder' sciences the work *የሳይንስና ቴክኖሎጂ መዝገበ ቃላት. The Science and Technology Dictionary (English-Amharic)* published by the Academy of Ethiopian Languages (1996) stands out. As the authors themselves emphasize in their introduction to *Archaeology: English-Amharic Dictionary*, the book emerges within a context of growing research as well as public awareness about archaeology in Ethiopia. This, however, has created its own problems. The fact that most research has been conducted by foreigners or it has been written about in foreign languages has created a situation in which the terminology employed by local authors largely relies on loanwords from English and a proper standardization of terms is missing. Additionally, when Amharic is used the trend is towards increasing confusion. So it has often been the case that authors have employed different terms to express the same meaning (the examples given by the authors are illustrative and include such terms as chopper/chopping tools, rendered as ቆራጭ and መጨፍጨፊያ; hominid, as የሰው ልጅ, ቅድመ ሰብ and ሰው አውራሽ; flakes, as ቆንጨራዎች, ጦር መሰል, ፍላፃ and ጦሮች; and cleaver, as ፋስ and የቆዩ የእጅ መጥረቢያዎች). Inversely, authors have also tended to employ the same term but with different meanings or even to change the original English meaning. The *Dictionary* is intended as a tool to help fix such kind of problems. In the introduction the authors summarize the book's goals: to serve as a handy tool for students, scholars and professionals in helping them conduct their study and research and publishing in Amharic; and to have other professionals–from teachers, to journalists, to curriculum developers–and the larger public benefit from archaeological science.

The effort made by the authors deserves recognition. On the one hand, they

have been assisted by renowned scholars, such as the late Amsalu Aklilu, the leading author of the *Amharic-English Dictionary* (1973). On the other hand, as they themselves indicate in the introduction, their emphasis has been on consistency and clarity. Thus, while the dictionary is not exhaustive, the authors have focused on the frequency of use (though without mentioning their method of establishing it) of the terms in order to choose the English terms to be included in the dictionary. Moreover, effort has been put into harmonizing the Amharic terms with the English terms, and when this was not possible (e.g. with such terms as *Homo erectus, Homo sapiens*) a definition was provided. The *Dictionary* also gives a transliteration of the English term in the Ethiopian script and some difficult terms (chiefly those related to lithic industries) are also accompanied by an illustration.

Yet, the merits of the work must not prevent us from noticing its shortcomings. On the one hand, while the contribution of Prof. Amsalu Aklilu has been certainly helpful for the project, it is regrettable that other important reference works were not consulted. Such standard titles as Leslau's *English-Amharic Context Dictionary* (1973) and Kane's monumental *Amharic–English Dictionary* (1990), which sometimes provide terms different from those given in *Archaeology: English-Amharic Dictionary*, come to mind. On the other hand, the *Dictionary* presents a number of flaws that the scholar cannot fail to notice. For the sake of analysis they can be divided into seven categories: spelling errors; wrong filing; inconsistency; muddled classification; odd choices; wrong description or translation; and omissions. Evidently the examples given below are samples only and not exhaustive.

As to the spelling errors, some of them are not to be expected in a work of this kind. Thus, a few entries feature mistakes such as "covex sidescraper", "field archieves", and "strategraphy". Next, the alphabetical filing is far too often wrong (e.g. "alternate flaking" p. 8, "characteristic waste product" and "chipped stone artifacts" p. 21, "compression rings" and "concave edge removal" p. 23, "convergent sidescraper" p. 24, "denticulate scraper" and "digital records" p. 30). This problem could have been partially averted had the authors chosen a more analytical and 'hierarchical' organization of the concepts, such as grouping thematically related terms (e.g. the big "archaeological" cluster in pp. 10-11) under the same heading. The third flaw category concerns inconsistencies, and it is extensive, too. Thus, the criteria by which some terms (e.g. "Cultural resources", "Field Work", "Camp site") have an initial capital letter and others do not, are unclear. Perhaps more seriously, more often than not there is no agreement between the grammatical value of English and Amharic terms; thus, English verbs are sometimes translated with Amharic nouns or adjectives and inversely (e.g. ስእላዊ ትእይንት for "to depict" on p. 30). In the category of muddled classification, the authors are often wrong when describing the parts of speech of the entries, in particular by mistaking nouns for verbs, adjectives for nouns, nouns for adjectives and so on (so, for instance, "to amputate", "to preserve" and "to attenuate" feature as nouns on pp. 8, 62 and 12, respectively; "data capture" is described as a verb on p. 28, but two lines below "data cleaning" features as a noun; "backed" and "coated" appear as nouns on pp. 13 and 22,

respectively). Next, and even though some may regard it as a matter of opinion, some choices made by the authors strike as odd. As mentioned above, why not group 'cluster' terms within the same heading, which would have prevented unnecessary repetitions and significantly improved the text's clarity? Additionally, it is difficult to understand the need for an Amharic transcription of the English terms, when the potential readership of the *Dictionary* will be competent in English. The most important aspect of the *Dictionary* is the Amharic translation or explanation of the English terms; but even here the authors score unevenly. On occasions they provide simply a wrong description (e.g. on p. 8 where "alienation" is described as ያልተለመደ ነገር; on p. 10 "archaeological ceramic" and "archaeological discoveries" appear with the same definitions, የአርኪዎሎጂ ግኝት and የአርኪዎሎጂ ግኝቶች, respectively; on p. 11 "architectural construction" is described as የአርኪዎሎጂ ንድፈ ግንባታ). Elsewhere, they provide a new Amharic term when better terms were already available (thus, on p. 9 ቅርስ translates "antiquity" instead of the widely accepted ጥንታዊነት) Yet, perhaps the most deplorable aspect of the book, which is explicitly conceived for practical uses such as field work and academic writing, is the omission of terms that no scholarly encyclopaedia or dictionary in the fields of archaeology and heritage management should fail to include. The list of those missing terms is disquietingly long. A few illustrative and important examples are the following: antiquarianism (but "antiquarians" is given), cistern, civilization, dating (but "relative dating"), dendrochronology, ditch, dowsing, enclosure, Enlightenment, exspoliation, foundations, layer, metal detector, nationalism, pit, Radiocarbon, resistivity surveying, rock art (but "rock art site"), Romanticism, taphonomy, varves and wall.

Archaeology: English-Amharic Dictionary is an ambitious book. Considering the expanding sector of higher education in Ethiopia and the growing need for reference works, titles such as the one under review are urgently needed; they are indispensable tools for the formation of new generations of academics and professionals and also to cater to a body of non-specialized readership. Moreover, professionals working with the Amharic language (authors, translators, editors) will benefit enormously from sound reference works, particularly in the fields of the humanities and social sciences. Yet, the *Dictionary* falls short of its objectives. Indeed, the work's ambitious goals are not matched by a corresponding level of care in preparing, editing and correcting the contents. On the one hand, the choices made by the authors appear as not ideal; this can be argued, for instance, with the loose alphabetical listing of concepts, which is oblivious of their intrinsic relations and make the consultation cumbersome and tedious. On the other hand, the *Dictionary* has far too many errors of all sorts (conceptual, orthographic, semantic); such flaws are not acceptable in a reference work that aspires to guide scholarship and the interested public. Apparently the authors cut short the necessary editing and correction stages in order to reach the market as quickly as possible. This seems to be further indicated by the lack of page numbers on several pages, such as pp. 4-7, 33, 40, 46, 50, 55, 65, 78 and 80. The hope remains that in a second edition the authors will address these indicated shortcomings and mishaps and thereby the *Archaeology: English-Amharic Dictionary* will turn into a true reference work for Amharophones

inside and outside Ethiopia in the important fields of archaeology and heritage issues.

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ACADEMIC NEWS

ON THE RELEASE OF THE FIRST ISSUE OF THE RENAISSANCE JOURNAL OF SOCIAL SCIENCES AND THE HUMANITIES

The maiden issue of Ethiopian Renaissance Journal of Social Sciences and Humanities (ERJSSH) appeared first in electronic version and later in print. The print edition was issued in November 2014 and it was the successful end point of yearlong academic and logistic challenges, institutional efforts and, above all, intensive teamwork. The moment called for a celebration, which was solemnly held on December 18, 2014 at Lamergeyer Hotel, Gondar. The celebration turned into one of the highlights in the academic year of our University. The participants included the President of the University, the deans, the directors, the department heads and research center coordinators as well as guests from various international institutions, university communities and other stakeholders. Besides celebrating the release of the first issue of ERJSSH, further objectives of the ceremony included disseminating the Journal among colleagues and different stakeholders and promoting its upcoming issues. The inaugural ceremony also helped the participants to share their experiences and to boost the quality of academic output within the university, which is called to contribute to good policy making and problem solving in the country.

Dr Andreu Martínez, recently appointed managing editor of ERJSSH, acted as the host for the meeting and opened the celebration with a short speech. He then gave the turn to Dr Yemataw Wondie, ERJSSH editor-in-Chief. Dr Yemataw delivered a welcome speech addressed to professor Mengesha Admasu, President of the University of Gondar, the deans of the different colleges and faculties, directors, heads of schools and departments and all other guests. Dr Yemataw stressed the importance of the maiden issue of ERJSSH, the online version of which appeared at a momentous time, when the University was celebrating its Diamond Jubilee. The journal is also the second of its kind to be published by the University after the Biomedical Science Journal. Dr Yemataw expressed his sincere thanks to the ERJSSH editorial members, who worked indefatigably to accomplish the goals set, and also to the initial committee, who took the initiative to conduct an assessment and to share experience from different universities to establish the Journal. He further appreciated the efforts of manuscript contributors, language editors and article reviewers, who sacrificed their precious time in critically reading, evaluating and commenting on the manuscripts. Furthermore, he emphasized that the release of the first issue of ERJSSH could not have been possible without the full support received from the College of Social Sciences and Humanities and the university's top management, particularly the Office of the Vice President for Research and Community Services. Miss Abebech Molla was also thanked for her important contribution in formatting and doing the layout of the Journal.

Dr Yemataw in his speech also dwelt on the history and organization of the Journal. He explained that before the senate of the University approved the present name, other names such as Journal of Maraki and Journal of Blue Nile were considered. The present name was chosen because it embodied the wish of the Ethiopian nation to regain the glory of the past with present achievements and efforts. He also provided a few hints concerning the ERJSSH's organization. The Journal is structured through two chief bodies: the first one is the main executive body, consisting of an editor-in-chief, a managing editor and three associate editors; the second body consists of an editorial board formed by senior academics and scholars from Ethiopia and abroad who provide consultation and guidance. Furthermore, a third external body is formed by the peer reviewers, which consists of a pool of more than eighty high-ranking national and international scholars from different fields within the area of social sciences and the humanities.

In his speech Dr Yeamataw also spoke of the specific story of the Journal's maiden issue. In the preliminary stages, dissemination of information–through social media, Email lists, and workshops–on the prospected Journal was done in order to receive contributions. A total of fifteen manuscripts were submitted to the editorial office. After going through the different steps, including plagiarism check, internal review, peer review, of the fifteen manuscripts, seven were chosen for publication. Out of these, six were original research articles and a seventh text was a review article. The articles published reflected the multidisciplinary nature of ERJSSH, encompassing different fields within the social sciences and the humanities, such as linguistics, geography, development studies, psychology, politics, and history.

The next speaker was Dr Menberu Teshome, acting Dean of the College of Social Sciences and the Humanities and member of the editorial team of ERJSSH. Dr Menberu said that the College has started the ERJSSH with the objective of publishing scientific research that would help to solve societal problems and support teaching learning process by disseminating the knowledge and publishing the original works of the staff of the College and the University so that can reach the wider public.

Dr Tadessse, acting Vice President for Research and Community Services, addressed the audience. Dr Tadessse congratulated the editorial team for their commitment in bringing out the second journal in the history of the University of Gondar into completion. He emphasized the importance of the arrival of the new journal, which coincides with an expansion in the activities of the Research and Community Services Office as well as with the return of the newly graduated PhD staff of the University. Therefore, the ERJSSH is called to play a crucial role in disseminating ongoing research to the wider community.

Prof Mengesha Admasu, President of the University of Gondar, gave the concluding speech. Prof. Mengesha congratulated the College of Social Sciences and the Humanities for realizing the vision of the University to have at least two journals running during the diamond jubilee year. He also

stressed that the University expected the College of Economics and Business Management to join soon with the release of its own journals. Moreover, Prof. Mengesha pointed out the importance of the goals of the Journal, including maintaining the quality throughout its issues, targeting an international audience and serving as a platform for the College's staff. Furthermore, the publication should serve to tackle problems at the local, national and international levels. Prof. Mengesha appreciated the support of the expatriates in sharing their skills and experiences and their contribution to the success of the Journal.

During the discussion session that followed, Dr Getahun, editor-in-chief of the Biomedical Science Journal, shared his six-years' experience of running the journal. Dr Getahun expressed his concern over the different challenges his journal faced. Among these were the problem of budget and human resources, the falling submission rate of articles, the struggle to keep up quality and peer reviewers' failing in their commitments. He finally underscored the need to focus on the sustainability of the Journal.

Following this, Dr Kassahun Tegegne, member of the editorial team of ERJSSH, raised issues related to the problem of plagiarism checker. So far the Journal work has been relying on free on-line versions of plagiarism checkers, which renders this task cumbersome. Hence, he requested the University to purchase licensed software to help in this task. He further stressed the importance of having access to online journals and databases for the academic community. For that reason he urged the university to subscribe to different publishers in order to have access to journals for teaching, learning and for research activities. In addition, the ICT Centre of the University should focus on supporting the webpage and online article submission system of ERJSSH and in assuring that the server is active on permanent basis.

On his part Mr Kelali Kiros, Dean of the Law School, appreciated the College of Social Sciences and the Humanities for successfully publishing its Journal and announced that the journal from the Law School would be soon launched.

Andreu Martínez
Kassahun Tegegne
Satyanarayana Kurma

University of Gondar

ABOUT THE JOURNAL

POLICY OF THE JOURNAL

The *Ethiopian Renaissance Journal of Social Sciences and the Humanities* (*ERJSSH*) is an official biannual publication of the College of Social Sciences and the Humanities, University of Gondar. The *ERJSSH* publishes original scholarly articles, reviews, discussions, synopses of major research, technical notes, and case reports within the Social and Behavioural Sciences, the Humanities and other related fields. Manuscripts to be published in *ERJSSH* are required to meet the standards of international academic journals, be original and not published or submitted for publication elsewhere.

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GUIDELINES FOR CONTRIBUTORS

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MANUSCRIPT PREPARATION

Articles are to be written either in English or, in cases when the thematic requires it, in Amharic. The file format should be supported by Open Office and Microsoft Word and files should be submitted in .doc/.docx (alternatively also in opd, rtf or pdf) formats. Contributions may not exceed 20 typed pages, or 8,000 words, including footnotes and references.

FORMAT AND STYLE

Texts should include the following specifications: Times New Roman or Bookman Old Style, 1.5-spaced throughout, 12-point font size and margins of 2.5 cm on the left and right. All notes are to be set as footnotes.

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ACKNOWLEDGEMENTS

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